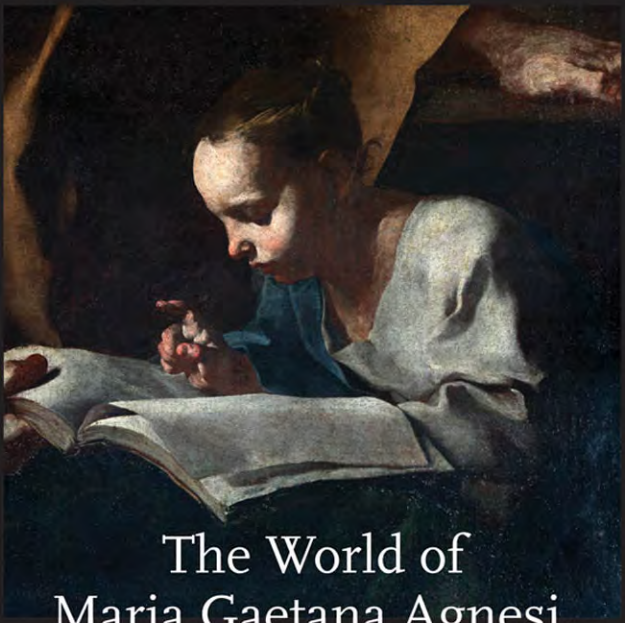

The World of Maria Gaetana Agnesi, Mathematician of God

MASSIMO MAZZOTTI

VISIT…

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in the History of Mathematics

Ronald Calinger,
Series Editor

The World of Maria Gaetana Agnesi, Mathematician of God

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Introduction: Another Enlightenment

The name Maria Gaetana Agnesi and the dates of her birth and death (1718–99) will probably be familiar only to the friendly but restricted community of historians of mathematics. Agnesi was indeed the first woman to publish a mathematics book, an early treatise on calculus dated 1748 and printed in Milan, then the capital of a small state under Austrian rule. When her book appeared, it was the most extensive and clearly written introduction to what was then still an esoteric branch of the mathematical sciences. Its publication made Agnesi a minor celebrity—or, rather, a curiosity—which meant that she was thereafter granted a few lines in every history of mathematics, often accompanied by a rather enigmatic portrait. The concise, abstract, and factually shaky biography contained in these lines has been reprinted with few alterations until very recently. Little has appeared in print about her besides these picturesque notes, highly colored marginalia to the serious history of mathematics—that is, the one concerned with the canon of Western rationality and its orderly succession. Agnesi's book, we have been told, was of little significance within the greater genealogy of modern mathematics, demonstrated by the fact that we do not associate any particular theorem or conceptual advance with her name, only a rather useless curve.[1]

Agnesi's name and some elements of her biography are also meaningful in a different context and for a different reason. This becomes clear when you visit the paleo-Christian basilica of San Nazaro, in the Milanese neighborhood of Porta Romana. The tourists who venture to this church on the edge of the old city are still outnumbered by the parishioners, who practice the sober Ambrosian rite, the ancient liturgy of the Milanese Church. At the entrance, you can purchase holy images and hagiographic booklets on the lives and miracles of local saints. Among them is the biography of one Maria

Gaetana Agnesi, who used to live a few steps down the street, in a palazzo on Via Pantano, and who was exemplary for her Christian virtue and charitable activities. She was not a member of a religious order but a wealthy parishioner who devoted her life and fortune to the support of the poor and sick of Milan. If you were to wonder whether this is the same Agnesi who is cited in histories of mathematics, the parish priest would answer, yes, she also wrote something about calculus. But that is clearly not why her life is on the shelf in the basilica.[2]

Linking this mysterious eighteenth-century Catholic heroine to the first woman to publish a mathematical work was not a straightforward task. It required delving into the underresearched life and work of someone who was, by the end of the eighteenth century, both a symbol of Catholic conservatism and a celebrated protagonist of the Milanese Enlightenment. In 1749, Agnesi was presented with jewels from the empress Maria Theresa of Austria, to whom she had dedicated her book, which argued for women's right of access to the "sublime sciences." At the same time, she was advising the archbishop of Milan on delicate theological matters—and exchanging letters with the pontiff, Benedict XIV. A fundamental tension between tradition and innovation pervaded both her life and her work, so much so that a nineteenth-century biographer described Gaetana Agnesi as a "psychological enigma."

The numerous biographical notes about Agnesi do little to help us understand what she did or the world in which she lived. Mostly, they insist on the conflict between religion and science, tradition and innovation. Due to a combination of scarce biographical resources and analytical categories that lack subtlety, Agnesi has suffered a peculiar historiographical maltreatment. For the last two centuries, the faint traces of her life have been molded into a series of stereotypical images to be deployed in different discourses and for different purposes. Thus Agnesi variously became a symbol of the Enlightenment, a heroine of counterrevolution and political restoration, a prophet of the national unification of Italy, a Catholic modernist, a proto-feminist, the ideal fascist woman, and even a potential saint of the Church, as shown by recent invitations to initiate the process to canonize her.[3]

I first came across Agnesi as a child, while running up and down the nave of San Nazaro under my grandmother's excessively tolerant gaze. I have a vague recollection of Agnesi's saintly portrait on the cover of dusty booklets

that had no pictures inside. I met her again many years later, while studying eighteenth-century calculus texts. I began leafing through her book simply to see how it compared with other, similar publications of the time. However, as I was taking notes about the formal features of her treatise, I couldn't help but wonder why someone like Agnesi would write a textbook of calculus in the first place. As we shall see, this was hardly an obvious choice for a young woman of her day. The few studies on Agnesi's mathematical work offer little clarification in this respect. The book, they say, was an early systematization of the techniques of calculus. Because it was judged to be clearly written, it remained in use for many years, although conceptually it was soon superseded by more advanced texts. The significance of Agnesi's book has thus far been assessed in relation to a perceived lineage of classic mathematical works. In this perspective a text's historical meaning is determined by its logical relation to the rest of legitimate mathematical production. Agnesi's book, one would conclude, is historically relevant not because it occupies an important place in the progress of Western mathematics—Agnesi is not credited with any major mathematical discovery—but because the author was a woman, at a time when hardly any women received advanced training in mathematics.

The present study originated from the perception that the historiographical tools deployed in this assessment of Agnesi's work are singularly unsuited to any attempt to reconstruct its original meaning. If we are to understand Agnesi's intentions and her use of the available cultural resources, we need to engage much more deeply with the sociocultural landscape in which she moved. But, then, why should anyone care about the supposed original meaning of a forgotten eighteenth-century mathematics textbook? As I began investigating the life of the Agnesi family, my conviction grew that the story of this woman and the creation of her book could be used to break through pervasive stereotypical images of scientific culture in the Age of Enlightenment. In particular, the materials that I began to unearth seemed to refer in important ways to the long-forgotten culture of the Catholic Enlightenment, a phenomenon described in just a handful of studies and then mostly limited to its theological and liturgical features. Exploring Agnesi's life and her world appeared to me to be an effective way of shedding light on the philosophical and scientific culture of the Catholic Enlightenment. I also came to believe that my interpretive attempt would provide me with an opportunity to investigate empirically some of the questions I find particularly interesting, such as the historical and situated nature of mathematical

knowledge, the relation between cultural traditions and their carriers, and, more generally, the relationship between social order and the structure and hierarchy of knowledge.

I began delving through archival materials and contemporary gazettes and publications, guided by a few basic questions. Why should someone with no formal training decide to research and write one of the earliest comprehensive textbooks on calculus, the most advanced branch of mathematics at the time? For whom was she writing? And why did this happen in Milan, a city with neither strong mathematical traditions nor solid scientific institutions to support her research? In fact, no one there had even cared to learn calculus before Agnesi did. This study is an attempt to address these and other related questions and hence to reconstruct the meaning of Agnesi's actions and writings as well as the salient features of her little-understood world.

Exploring how Agnesi related to her world also proved relevant to another set of questions about the status of women in eighteenth-century Europe and the conditions of their access to and use of knowledge. How did a woman manage to be recognized as a legitimate mathematical author notwithstanding the obvious gendering of contemporary philosophical and mathematical practices? In Europe, the places of production and transmission of high-status knowledge—that is, universities and academies—were generally forbidden to women. There were, however, a few significant exceptions. In recent years, historians have highlighted the unusual visibility of women in Italian intellectual life between the late seventeenth and mid-eighteenth centuries. A growing body of literature indicates that Italy was the only part of Europe where women had "the possibility to participate actively in the scientific life of the academies and obtain teaching posts there as well as in universities." In other words, Agnesi's case is not as isolated as it might at first appear to be. Scholars such as Marta Cavazza and Paula Findlen have argued convincingly that Italian academic institutions, unlike their French and British counterparts, were places where talented women could "negotiate their way through the scientific networks." Reflecting on the academic achievements of Italian women and on the positive attitude that seems to have surrounded them, Londa Schiebinger concluded that "Italy was an exception in Europe, and little is known about why women professors were acceptable to the Church and university." Certainly, the surviving evidence tells us about only a handful of *filosofesse,* as the Italian women philosophers were known, but that is enough to suggest that there were

specific reasons for such a remarkable anomaly. As we shall see, reconstructing Agnesi's education, work, and intellectual legitimation enabled me to identify some of these conditions and suggest a possible explanation for the otherwise puzzling phenomenon of the *filosofesse*.[4]

My reconstruction of Agnesi's world raised some methodological problems. First, I encountered severe documentary limitations. Agnesi, a woman who lived at the margins of enlightened Europe, was always perceived as a figure of little historical significance, and most textual and material documentation about her has long since been dispersed. My strategy, therefore, was to compensate for the scarcity of direct information about Agnesi and her circle by relying as much as possible on indirect evidence, such as that provided by various legal documents relating to the administration of the Agnesi's family patrimony and particularly to the family's financial troubles in the mid-eighteenth century.

Second, I had to decide how to use these sources. In other words, how should I proceed once I decided to problematize and explain the production and properties of a piece of mathematics or philosophy, rather than taking them for granted as the necessary outcome of pre-existing traditions? It seemed only reasonable to assume that, if I were to treat these cultural practices like any other intentional human action, I could try to reconstruct their meaning by using a host of well-tested ethnographic and microhistorical techniques. This move would mold the form of my explanations: instead of making the historical materials fit some pre-existing conceptual scheme, I would try to explore empirically the actor's social world. The answers to my guiding questions would then emerge from the investigation of the available historical documents. This meant, for example, that instead of being content to state that calculus at the time was evolving toward a higher level of abstraction—as if this were somehow a self-evident end—I had to try to see this phenomenon as the actors saw it and thus reconstruct its contingent meaning, which could only emerge from a close inspection of empirical data. In other words, I decided to turn a simple story into a complicated one.[5]

The principal way in which I decided to complicate Agnesi's story was by varying the scale of the analysis, in contrast to the fixed analytical level of most reconstructions in the history of mathematical and philosophical knowledge. This choice enabled me to deploy a much higher number of variables—in other words, I tried to describe and understand Agnesi in

more areas of experience than those usually considered pertinent. I hoped that putting Agnesi's life under the microscope might reveal important factors that would otherwise remain hidden, as when one alters the scale of a map to explore the buildings that make up a village. Changes of scale can be rich in cognitive implications; they do not simply alter the size of visible objects but transform the very contents of the representation.

The choice of a micro-level analysis and a focus on a few individuals—Agnesi and her closest acquaintances—should not be perceived in opposition to a social analysis, of course. It is, rather, a methodological option for the analysis of a specific set of conditions of social experience. This means that I did not follow Agnesi and her enterprising father around the Milanese sociocultural space because they were exceptional or even because they were in some way typical or exemplary. Rather, focusing on them was a way to enrich our understanding of their world because it revealed both the ways in which they experienced constraints and possibilities throughout their lives as well as the presence of various resources—natural and cultural—that they could mobilize as part of their own social strategies.[6]

Social strategies such as those outlined in this study do not imply some form of abstract rationality. Rather, they seem to be inextricably related to the actors' construction of their own identities and to their representations of the relational space in which they move.[7] Indeed, following the Agnesis around I could have also been mapping the contours of a space of possibilities, the "invisible structures" of their everyday experience.[8] It soon became clear that the patterns thus revealed extended well beyond the local Milanese dimension. This enabled me to broaden the scope of my initial considerations and to formulate far-reaching hypotheses, such as those concerning the making of the Catholic Enlightenment or the eighteenth-century phenomenon of the learned woman.[9]

I am inclined to resist saying that my aim in this study was to put Agnesi and her book "back in their own context." This and other, similar expressions have often been used to endorse functionalist interpretations that overly emphasize the coherence, homogeneity, and static nature of cultures. According to these interpretations, contextualizing a text or a form of social behavior means showing how it fits into a pre-existing system of norms. Instead, I tried not to assume that social structures, mechanisms, or identities were givens, or unproblematic objects. Rather than relying uncritically on standardized descriptions of the early-eighteenth-century cultural and so-

cial background, I turned the conditions in which the Agnesis' strategies and choices assume their meaning into part of the object that I was trying to construct, describe, and understand.[10]

One of the effects of such a dual reconstruction of structure and action, context and meaning, is to facilitate the emergence of the protagonist's agency. The Agnesi you will find here is not simply "a product of her age"—another expression that indeed emphasizes too crudely the deterministic effects of social conditions on cultural productions and forms of intentional behavior. While outlining Agnesi's relationships to various traditions—religious, political, philosophical, and mathematical—I tried to reconstruct the way in which she understood, practiced, and used them in her maneuvering and decision-making. Clearly, these traditions offered her the resources to know about the world, her society, and herself. However, what she eventually did with them was the result of choices that could have been very different. On closer inspection, the traditions with which she interacted reveal their flexible, negotiable nature: it is Agnesi that we see acting on and through norms and traditions, rather than the other way around.[11] Thus, her story offers convincing evidence against any fully fledged form of social and cultural determinism, highlighting instead the "conditional liberty" of social actors and their creative use of existing normative systems.[12]

Studying the way in which Agnesi contributed to the transformation of tradition offers the opportunity for further empirical considerations on the characteristics of knowledge and cognition.[13] Thus, her relation to the constraints and resources offered by each of these traditions seems to be essentially similar, including her use of and contribution to a specific mathematical tradition. Nothing fundamentally distinctive seems to emerge about the culture of science, and of mathematics in particular, with respect to other forms of human knowledge. The mathematical tradition used and transformed by Agnesi seems to have been as flexible and as open to interpretation as any other tradition to which she related. This should not come as a surprise given that, ultimately, even the status of mathematical knowledge depends on the contingent judgments of particular expert groups.[14]

Focusing as I do here on the self-conscious attempt of some individuals to change their society's shared beliefs raises obvious questions about the relationship between knowledge and power, which cannot be properly addressed within the limits of this study. However, studying the making of the Catholic Enlightenment and its rapid decline provides us with further evi-

dence that, although separable for analytic purposes, the cognitive and social orders of any group are produced, sustained, and transformed together—and thus should be studied and understood together. In this story, as in other reconstructions of historical attempts to change beliefs, the production and stabilization of knowledge is indeed a problem in politics, and, conversely, any modification of the social order involves cognitive readjustments in order to succeed. This theme runs through the entire book and culminates in its final image of the disintegration of the Catholic Enlightenment as a material, cultural, and political event.[15]

Finally, I owe readers a clarification about my use of the term *Enlightenment* in the title of this introduction. Recent and not-so-recent studies of eighteenth-century culture have inexorably undermined the once commonly accepted image of a unified "Enlightenment project"—a coherent set of values and objectives that was championed by a group of great men and gradually diffused throughout Europe and the world. Growing empirical evidence has replaced this image with a variety of local phenomena, a constellation of beliefs, interests, problems, and practices that can be related to one another at most through the notion of family resemblance.[16] This historiographical reassessment has been accompanied by a more general reorientation in our understanding of scientific practices, which are now routinely studied in relation to the contexts in which they occurred rather than to some form of abstract rationality.[17]

I take for granted the fragmentation of the Enlightenment's intellectual unity, the local nature of its scientific practices, and the futility of all attempts to identify anything like its essence. In what follows, I use *Enlightenment* sparingly and always specifically. Hence, I refer to the leading figures of the "Milanese Enlightenment," definitely a problematic expression, but one that can still be useful in identifying a specific cultural and political program. Occasionally, I make reference to such historiographical concepts as "pre-Enlightenment"—admittedly, with polemical and ironical intent. Mostly I speak of a "Catholic Enlightenment," a phrase that retains a slightly oxymoronic feel despite recent invitations to rethink the relationship between the many Enlightenments and the religious traditions with which they interacted.[18] This study addresses the nature of this interaction and its long-overlooked significance.

Thus far I have not made a strong case for using the word *Enlightenment,* let alone placing it in the title of this introduction, but I decided to do so for

three reasons. My first reason, admittedly a weak one, is the reference to a specific sociohistorical phenomenon—the Catholic Enlightenment—which this study aims to chart and understand through the story of Agnesi and her book. In this respect, the study aims to contribute to the reconstruction of one of the many cultures that coexisted in Enlightened Europe—what Roy Porter suggested we call "the enlightenments."[19] However, it will soon become clear that the goals of this study are not primarily taxonomic and definitional.

A second reason has to do with the methodological choice of Agnesi as the protagonist of my story: a relatively marginal figure—a woman—situated at the cultural and geographical periphery of what is usually considered enlightened Europe.[20] The "otherness" here lies in trying to reconstruct the making of the Catholic Enlightenment on the basis of how a woman with no access to formal education experienced it, rather than relying exclusively on the texts of its principal theorists.

The last and strongest reason to use the word *Enlightenment* has more to do with us than with Agnesi and her contemporaries. As has often been noted, assessing the Enlightenment is an exercise that reveals, above all, the assessor's beliefs and concerns about the modality of social and cognitive change. In this sense, the phrase "another Enlightenment" is an invitation to free our analysis from the deeply rooted stereotypes that continue to shape our understanding of social and cognitive change well beyond eighteenth-century studies. The main way in which *Enlightenment* enters this study is neither as an analytic tool nor as the object of a direct investigation, but rather as a mythical image that remains in the background of the narrative as a polemical target.[21]

Seen in this way, *Enlightenment* is a set of stereotypes that were precisely shaped during the eighteenth century and have sustained the discourses of reason and tradition ever since. At its simplest, the term emphasizes the opposition of individual reason to authority and collective pressure. Whig history and blatant teleological reconstructions of the Enlightenment epic are certainly out of fashion, but the dualist myth of the individual who liberates his reasoning from the yoke of tradition is alive and well and continues to feed the discourse of the Enlightenment project in political and social theory. This discourse is used, for example, to defend the alleged boundary between myth and science, the closed character of the former being opposed to the critical method of the latter, or to perpetuate stereotypical images of the "traditional society" as static and resistant to change.[22] On the contrary,

anthropological and historical evidence suggest that the basic set of skills and inclinations that constitute the basis of "rational behavior" are present even in the simplest of societies and that the spectacular variety of human cultures—including scientific ones—is the product of deploying these abilities within different social and cultural settings.[23]

The story of Agnesi as narrated here offers a reminder that, just as individual behavior cannot be properly understood if abstracted from the specific collective in which it is situated, so it is impossible to separate rationality from tradition: they are both everywhere.[24]

This book is, therefore, an invitation to study the achievements of those eighteenth-century women and men who self-consciously struggled to change the beliefs and social life of their contemporaries without subscribing blindly to the categories of the Enlightenment myth. What I suggest is not the pursuit of absolute objectivity, of course, but rather the combining of our sociohistorical reconstructions with a reflection on the origins of our analytical categories and their meaning within contemporary sociological and political discourse.

The World of Maria Gaetana Agnesi, Mathematician of God

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CHAPTER ONE

Engaging in a Conversation

Milan can be unpleasantly hot and humid in the summertime, but strolling its streets in the summer of 1739 must have been an unpleasant experience even by Milanese standards. According to the local gazette, by early July the lack of rain and fresh air had already caused "damage to the health of bodies as well as to the ripening of the fruits of the earth." As the sky remained obstinately clear, religious processions were organized to entreat the Almighty for rain. On 9 July, an imposing procession of secular and regular clergy moved from the metropolitan cathedral to the basilica of Sant'Ambrogio, protector of the city, whose intercession was implored. When there were no immediate results, the civil authorities told the archbishop to arrange another procession, for 17 July. This time the clergymen left the cathedral and paraded toward the ancient church of the Beata Vergine presso San Celso, where a miraculous image of the Virgin, which had already assisted the city in times of war and plague, was preserved. Along the way, they intoned the *Miserere* and ended by celebrating a solemn chanted mass *ad pluviam petendam* (to plead for rain). Other processions and communal prayers took place in Milanese churches on subsequent days, organized by the numerous religious orders and lay congregations of the city. Entreaties were made to all possible advocates, whether they were minor saints with a local reputation for miracles or ancient images of the Holy Virgin.[1]

At the same time, two Burgundian gentlemen were exploring Milan in search of the remains of its classical past, apparently oblivious to the baroque spectacle of the religious processions. They were Charles de Brosses, *conseiller* at the parliament of Dijon and its future president, and Germain Anne Loppin de Montmort, *conseiller* at the parliament of Bourgogne and also a mathematician and "intimate friend of straight lines." The two men, aged around thirty, were seeking works of both classical antiquity and the

masters of the High Renaissance—Raphael above the rest. They soon realized that, compared to other destinations of their Italian tour, the city had little to offer in this respect,[2] so they were delighted by the sixteen Corinthian columns facing the basilica of San Lorenzo, which in their eyes were far more interesting that the half-finished Gothic exterior of the metropolitan cathedral. In fact, they judged the San Lorenzo ruins—the remains of an imperial porch—to be "a nobler and more beautiful spectacle than the rest of Milan and Genoa put together."[3]

The baroque and rococo façades of Milanese churches and the notorious gloom of their interiors aroused little enthusiasm in classically inclined foreigners on the Grand Tour. By the end of the seventeenth century, the interiors of Milanese churches had typically taken on a distinctively heavy, dark baroque style, which was quite a contrast with, say, the airy and luminous baroque of Piedmontese churches and palazzi. This local taste could be said to have culminated in the stunningly macabre spectacle of the sanctuary of San Bernardino, completed in 1695 and run by a lay confraternity. The high walls of this rectangular chapel are literally covered with skulls and other human bones, assembled in a variety of ornamental motifs. In the gleaming light of votive candles, a black-clad Lady of Sorrows (Madonna Addolorata) mourns her dead son. Only by raising one's gaze upward can one see reassuring light filtering through small windows to illuminate a cupola lined with a fresco in the Venetian rococo style, painted by Sebastiano Ricci. It portrays pale souls moving gracefully across a blue sky toward their final destination, surrounded by a multitude of angels. The contrast between the miserable and transient earthly condition of material bodies and the weightless triumph of purified souls could not have been represented more effectively. Among those who certainly appreciated this theatrical apotheosis was John V of Portugal who, following his 1738 visit to Milan, decided to replicate the bone decorations in a chapel of the church of São Francisco at Évora, near Lisbon.[4]

Disturbed as they were by these ominous features, Brosses and Loppin nevertheless explored Milanese churches in search of old masters. Brosses took careful note of the Raphaels and da Vincis that enriched the city churches before the Napoleonic age. The two Frenchmen found little worth mentioning about the exteriors of the palazzi of the nobility, but they reported enthusiastically on the impressive size of their apartments, the rooms arranged in never-ending enfilades, and the richness of their galleries, where

paintings, sculptures, drawings, and precious artifacts were proudly displayed. Brosses also praised the "magnificent" libraries of senatorial families such as the Pertusati, Archinto, and Simonetta. Most of all, they enjoyed browsing through the library of the Jesuit College of Brera—the best in Milan for modern books—and through the excellent collection of ancient manuscripts and incunabula of the Biblioteca Ambrosiana. Owned by the Milanese Church, or "Ambrosian Church," after its founder, this library was also remarkable because it routinely opened its reading room to the general public for six hours a day. On the other hand, Brosses was little impressed by the remains of the cabinets of marvels that earlier generations of travelers had admired, such as the museum of Manfredo Settala, canon of San Nazaro. In Brosses's pages, Settala's once fascinating automata and natural curiosities were worth only a few ironical remarks in passing.[5]

On the evening of 16 July, after a day spent wandering through libraries and churches, Brosses and Loppin arrived in the *sestiere* of Porta Romana, one of the six administrative districts of the city. Tired and thirsty, they probably passed by the "prodigiously long" terra-cotta façade of the fifteenth-century Ospedale Maggiore, turned into a narrow street in the Pantano quarter, and in a few steps reached the main gate of the Palazzo Agnesi, on the corner between Pantano and Chiaravallino streets. The palazzo, which faced the small Bottonuto square, with its ancient cross, had three stories, plus a mezzanine for servants and service rooms. Its simple design, composed of straight lines, followed the classical canon. The tops of the windows' cornices were flat, and only the entrance conceded slightly to the baroque inclination for softer lines. However, as Brosses and Loppin were soon to discover, the severe façade of the palazzo contrasted markedly with its luxurious interiors.

Grey-liveried servants took the two Frenchmen through the porched courtyard with its tall Tuscan columns, then up the stairs to the first-floor apartment. Under the porch they must have noticed the palazzo's luxury vehicles: a landau painted and lined in "the color of the air," plus four large red-painted carriages and berlins covered with gilt decorations and embellished with gold braid and silk fringe, their interiors lined with colorful silks and velvets: yellow, green, red, grey. Some of the guests' carriages—invariably rich in gilt decoration, as was fashionable among the Milanese—must also have been in the courtyard.

Upstairs, after passing through a small drawing room adorned with land-

scapes, Brosses and Loppin entered a large salon with a crystal candelabra, a large chimney, gilt tables, walls covered in golden silk tapestries, and about twenty chairs upholstered in the same type of material. The Holy Roman Emperor Charles VI and his consort, Elizabeth Christine, gazed down on the two men from large portraits. The military trophies carved into the frames commemorated victories in the Balkans in the 1710s, when the legendary Eugene of Savoy, governor of Milan, had been in command of the imperial armies. In those days, captured Turkish flags had been sent back to Milan to be hung in the cathedral in thanksgiving, together with the tails of Turkish war horses. The celebratory carvings must have looked rather outdated in July 1739, as fresh imperial troops were marching through the city on their way to Belgrade in a desperate attempt to rescue it from a siege. The emperor's crusading ideals would end that very year in an expensive catastrophe.[6]

The far door opened onto yet another large salon with tapestries of crimson damask, the same material being used to cover a dozen chairs and make the long curtains at the windows. The fireplace was hidden by a golden fireguard and surmounted by a large mantelpiece mirror framed by gilt arabesques. The same arabesque pattern could be seen in the tables along the walls, in another mirror, and in the frames of the doors. From one doorway, Brosses and Loppin could glimpse the Chinese room, where chairs and little tables painted in Chinese style were surrounded by green satin and embroidered floral decorations in gold and silver. They then passed through a gallery, decorated with two large crystal candelabra, that overlooked the internal courtyard, and entered yet another salon.

Far from the street and so quieter than the others, this salon was devoted to concerts: it had at its center a damask-covered harpsichord, surrounded by numerous padded chairs. There were also mirrors, wall-tables, and gilded candle-holders, but the most notable feature of the decor was the collection of forty-odd paintings hanging on the walls. Mostly comprising scenes from the life of Christ and the rest of the New Testament, their carefully planned disposition was rich in meaning, with physical proximity and identical framing being used to create associations between, say, nativity scenes and those of martyrdom and passion. The largest painting celebrated the event at the heart of the Christian faith: the resurrection of Christ. In addition to the religious works, there were also a good number of small and medium-sized paintings in minor seventeenth- and eighteenth-century genres: still lifes, seascapes, landscapes with figures, and sylvan landscapes

(*boschereccie*). However, because of their size and placement, they had a marginal role in the overall display.

The main apartment of the palazzo included other richly furnished salons, rooms, and cabinets, but the harpsichord salon was probably where Brosses and Loppin were invited to take a seat amid a selected group of people "from all the nations of Europe."As they sat, they were immediately served a glass of iced water. Brosses thought that this was a good way to begin a conversation.

As usual, Count Carlo Belloni was welcoming the guests—around thirty that night—and assigning seats. He recognized Brosses and Loppin, whom he had personally invited a couple of days earlier. Belloni suggested that they sit closer to the sofa where Maria Gaetana Agnesi and her younger sister Maria Teresa were sitting and conversing amiably with some other guests. Brosses had arrived at the Palazzo Agnesi planning to have an "ordinary conversation" with the twenty-year-old Gaetana, whose exceptional intellectual abilities were renowned in northern Italy. That was what had happened at other, similar soirées, such as the one he had gone to at the Palazzo Simonetta. Count Simonetta, Brosses reported, was "a knowledgeable and well-mannered young man," "very affable with foreigners," and keen on showing his library and gallery of paintings, which included works by Titian and some drawings by Leonardo da Vinci. His wife, who had good connections in Paris, gave the most exclusive receptions in the city, where one could play for the highest stakes.

That evening at the Palazzo Agnesi, however, things would be quite different. Under Belloni's guidance, everybody in the room positioned their chairs to form a circle around the two sisters, thereby turning themselves into an audience. Belloni rose and theatrically asked for their attention. He then addressed Gaetana with a "beautiful harangue," speaking in Latin "so that everybody could understand him." He mentioned some phenomena in natural philosophy, the explanations of which were controversial, such as the nature of tides and the origin of spring waters. Then Gaetana began debating with him on these issues, also in Latin. What they were performing was something similar, at least in its form, to an academic disputation of the kind in which adolescent boys were trained in religious colleges. "She spoke like an angel about these matters," Brosses remarked, impressed by Gaetana's Ciceronian oratory.

As this first disputation was concluded, Belloni invited Brosses to debate

with her on a topic of his choice, be it philosophical or mathematical. Taken by surprise, Brosses began by offering compliments to the young lady in his rusty Latin. Then, as he became more confident and fluent, he discussed with her for about an hour the nature of the soul, the problem of the relationship between the soul and the body, and the nature of light and colors. Then, admitting his little inclination for mathematics, he asked his friend to raise some issues concerning geometry. Having requested permission to speak French, Loppin began by asking Gaetana about the properties of various curves. Brosses did not understand much of this discussion, but he could appreciate even more the purity of her Latin, as she continued to reply in that language.

As the spectacle ended, everybody rose from their chairs and conversation became general, the salon filling with the sounds of various languages, and some of the visitors had the opportunity to chat informally with Gaetana. Passing by the two Frenchmen, she said that she was sorry that their first meeting had to take the form of a disputation. She didn't like to discuss such topics when in the company of a great many people: for each person who was genuinely interested, there might be twenty who were bored to death. These, she thought, were matters to be discussed with a few like-minded friends. Brosses found as much common sense in these remarks as in her philosophical pronouncements.

The long summer evening eventually turned into night. Candles were lit and the guests were served a selection of fruit-flavored ices and ice creams. Teresa sat at the harpsichord and played some pieces by Jean-Philippe Rameau, then sang some arias that she had composed herself.[7]

Brosses found the soirée at the Palazzo Agnesi rather puzzling. In what sort of gathering had he just participated? Although in many ways it had resembled the Parisian *esprit de société,* the term *salon* is probably not the most apt for this sort of social activity. For one thing, that word emerged much later in the century; moreover, its use could hide the distinctive features of the form of sociability that we have just encountered. Gaetana and her interlocutors used the term *conversazione* (conversation) to refer both to their gatherings and to the circle of the most assiduous participants. They also referred to Gaetana's disputation as an *accademia domestica* (domestic academy). The pages that follow conform to these usages.

The first thing to note about the Agnesi conversazione is that philosophical disputation was not a traditional way of entertaining guests in sim-

ilar circumstances: rather, communal reading, witty conversation, and gambling were the norm. Guests might occasionally discuss philosophical matters, but holding a formal disputation would definitely have been peculiar. The conversational forms for philosophical discussion had indeed been outlined and successfully publicized in the best-selling book *Newtonianism for Ladies,* printed in Milan toward the end of 1737 by the Venetian polymath Francesco Algarotti. He offered his readers the Newtonian philosophy of nature as something new and exciting to read as well as a subject for gentle conversation, but his model of sociable philosophy was quite distinct from the formal disputation staged at the Palazzo Agnesi. Also, Algarotti had explicitly banned mathematics from the topics that could make for a rewarding conversation.[8]

Another unusual feature of the Agnesi conversazione was that Count Carlo Belloni played host instead of a member of the family. While carefully directing events from behind the scenes, Pietro Agnesi, Gaetana's father, always maintained a low profile. As for his wives—Pietro married three times—there is no evidence that they ever played a significant role in the dynamics of the conversazione.

A gifted and intellectually curious man, Belloni had received a solid philosophical education from a nobiliary college, having, like most of his ancestors, specialized in law, hence his title of jurisconsult. The Bellonis were a patrician family from the provincial town of Pavia, thirty kilometers south of Milan. They had participated in the local administration of their city since the fifteenth century, and in the seventeenth they also began to take part in the administration of the state; in fact, Carlo Belloni's grandfather had been president of the Milanese senate between 1675 and 1682. He had also acquired the royal fief of Montù Beccaria and, with it, the hereditary title of count. After that, the family's prominence seems to have diminished somewhat, yet Carlo, like his father, would still marry into a prestigious senatorial family. Scant evidence about him survives, but his association with Pietro Agnesi seems to have been part of a broader strategy to detach himself from Pavia's provincial atmosphere and enter the Milanese stage of brilliant conversazioni and cultural circles. His enthusiastic participation in the activities of the Milanese branch of the Rome-based Arcadia Society, the main literary society of the peninsula, seems to confirm that Belloni cultivated social and cultural ambitions that could not be fulfilled in the provinces. To Pietro, Belloni offered brilliant manners, vast culture, easy speech, and the savoir-faire of a well-groomed patrician. Having said that, center stage of the Ag-

nesi conversazione was reserved for the display of the extraordinary breadth of knowledge of a young woman, Gaetana, and the musical talent of her sister Teresa.[9]

The setting for the Agnesi conversazione was also remarkable. The Agnesi sisters performed against the severe background of modern religious paintings in which the representation of the passion, death, and resurrection of Christ had a pre-eminent role. Patrician families in Milan, as elsewhere, had built their collections around Renaissance and seventeenth-century masters, emphasizing the representations of mythological themes that could function as a celebration of the virtues of the house. The same pattern could be found in the frescoes that decorated their palaces and country villas according to stylist canons imported from the Venetian Republic. Portraits of ancestors were also particularly meaningful in a city like Milan, where, for the previous couple of centuries, local politics had depended essentially on connections with such distant capitals as Madrid and Vienna. Indications of political affiliation, legitimation, and patronage would be proudly exhibited through the clothing and decorations of portrayed family members. Being related to a high-ranking officer in the imperial army or in a ministry in Vienna was an essential connection for great landowning families such as the Borromeo or the Trivulzio, whose financial and political network extended well beyond the borders of the state of Milan.

One would look in vain for similar ancestral portraits in the rooms of the Palazzo Agnesi. Rather, the taste that had shaped the Agnesi collection appears to have been similar to that of high-ranking Milanese ecclesiastics, who were traditionally among the foremost collectors in the city. Consider, for example, the collection put together in those same years by Archbishop Giuseppe Pozzobonelli. Although certainly much more expensive than the Agnesi's, it was characterized by the same thematic dichotomy between sacred subjects and sequences of landscapes and seascapes. Landscape painting was also favored by ecclesiastic collectors in Bologna and Rome. The Catholic Church looked benevolently on this genre because it could contribute to the promotion of the Arcadian esthetic favored by the Roman Curia, along with the literary productions of the Arcadia Society and its numerous branches—or "colonies," as they were called. Pietro's collection thus suggests that the moralistic classicism of early eighteenth-century Arcadian culture and its religious meaning were essential elements of the Agnesi conversazione.

What his collection lacked might be equally significant. Neither Pietro

nor Pozzobonelli owned examples of the various minor genres (Pulcinellas, beggars, macabre scenes) favored by most aristocratic collectors, whose preferred painters included Alessandro Magnasco (1667–1749), who had worked for the Grand Prince Ferdinando de' Medici. While in Milan, Magnasco was employed primarily by families linked to the so-called German party in Vienna, and he clearly had a difficult relationship with the religious authorities. Studying the activity of painters such as Magnasco can be a useful way of mapping an important divide within Milanese visual culture, which followed the lines of religious and political patronage. For our present purposes, let us simply note that the absence of genres and artists that can be related to anticurial positions further sharpens the cultural features of the Agnesi conversazione.[10]

It would be incorrect to state that Pietro did not own ancestral portraits. He did; he just didn't keep them in the main apartment. They were downstairs, far from the visitor's eye, in a large room that faced the garden and was used to store old pieces of furniture. Amid walnut wardrobes and oak chests filled with carpets and clothes, not far from where servants kept their liveries, was a group of second-rate paintings, not good enough to be displayed upstairs. These included landscapes, perspectives, a Virgin Mary, and two medium-sized portraits: Signor Giuseppe Mariani, Pietro's maternal uncle, a wealthy merchant, and Signor Carlo Alfonso Brivio, his father-in-law, a member of a cadet branch of the counts of Brivio, feudatories of Montevecchia. In 1752, compiling an inventory of Pietro's properties after his death, a notary added in his neat handwriting the nobiliary prefix "Don" in front of the name of the portrayed Brivio. Then he scraped it off quickly, as if he had suddenly realized, or been told, that neither Pietro's ancestors nor his wife's had had any right to noble titles. The notary certainly knew that such an apparently minor abuse could be severely punished.[11]

The Agnesi had settled in Milan at the beginning of the seventeenth century. Giacomo Agnesi, a cloth merchant from the provincial town of Vercelli, had become a Milanese citizen in 1612, some ten years after his arrival.[12] Toward mid-century, his descendent Pietro married a local woman by the name of Prassede Mariani, the daughter of Giuseppe, a wealthy merchant in gold and silver cloth. Pietro's sons, Antonio and Giacomo, would later become well-known silk merchants. In 1717, with the death of their uncle Giuseppe Mariani, the Agnesi brothers inherited a conspicuous patrimony, which included large quantities of stored cloth, city houses, and farm-

land in various towns in the state of Milan. Combined with the Agnesi patrimony, this inheritance made the family one of the richest among the city merchants. Although living in separate nobiliary houses, a sign of their remarkable wealth, the two brothers administered their patrimony in communion. Giuseppe Mariani had left explicit instructions about this in his will, in which he made all properties subject to a *fideicommissum*—an obligation to bequeath them intact to the next generation. Giuseppe's interest in the future of the house of Mariani is also reflected in his request to have his nephews add his surname to their own.[13] For the next twenty years, the Agnesi Mariani would constantly invest in land and real estate. One of the most important of these investments was the acquisition of a former feudal possession near Desio called Valera, which included land and a noble mansion (*casa da nobile*). The Agnesi bought this property in 1719 from the Marchese Giovanni Parravicini for the remarkably high price of 72,922 imperial lire.[14]

Giacomo married Giovanna Cortinovis and had four children. When he died in 1736, the entire family patrimony passed undivided to his heir Pietro, Gaetana's father, Antonio being childless. At that point, Pietro's sisters Giuseppa Teresa and Maria Antonia had already entered the cloister, in the Milanese monasteries of Santa Caterina alla Chiusa and Sant'Antonio, respectively. Giacomo's second son, Federico, became a Benedictine monk under the name of Giuseppe Antonio, and renounced his hereditary right in exchange for a life pension of 120 lire per year.[15] Pietro did not continue in the trade so brilliantly pursued by his father and uncle. He would later declare that his father had "always kept him away from the family business."[16] In fact, the Agnesi brothers did more than that: through their wills, they prevented Pietro from ever selling any family property. If the *fideicommissum* was a rather common practice among wealthy merchants of the time, less usual was Giacomo's requirement that Pietro be in total agreement with his uncle Antonio and, in case of disagreement, that he uphold, "invariably and without complaint," his uncle's decisions. Following Giacomo's death, Antonio was also charged with carrying out a series of important financial operations: collecting credit, selling the unsold stock from the family workshops, and depositing the resulting cash with the Ospedale Maggiore at an interest rate of 2 percent. Giacomo also asked his beloved (*dilettissimo*) brother and long-term partner Antonio to keep an eye on Pietro to make sure that the testamentary dispositions would be realized in full.[17]

A similar pattern of legal settlements is to be found a few years later in

Antonio's own will. In November 1739, Antonio, who had remained childless, nominated Pietro as universal heir of the Agnesi fortune. But once again Pietro's ability to act independently was to be strictly limited: any relevant financial operation and investment had to be completed under the supervision and with the approval of his brother, the monk Giuseppe, whom Antonio called his "dearest nephew" and the one he had "always loved like a son." Giuseppe agreed to act as a guarantor for Pietro, which reassured Antonio, who would otherwise have imposed an official executor on Pietro to ensure that he dutifully complied with the instructions.[18]

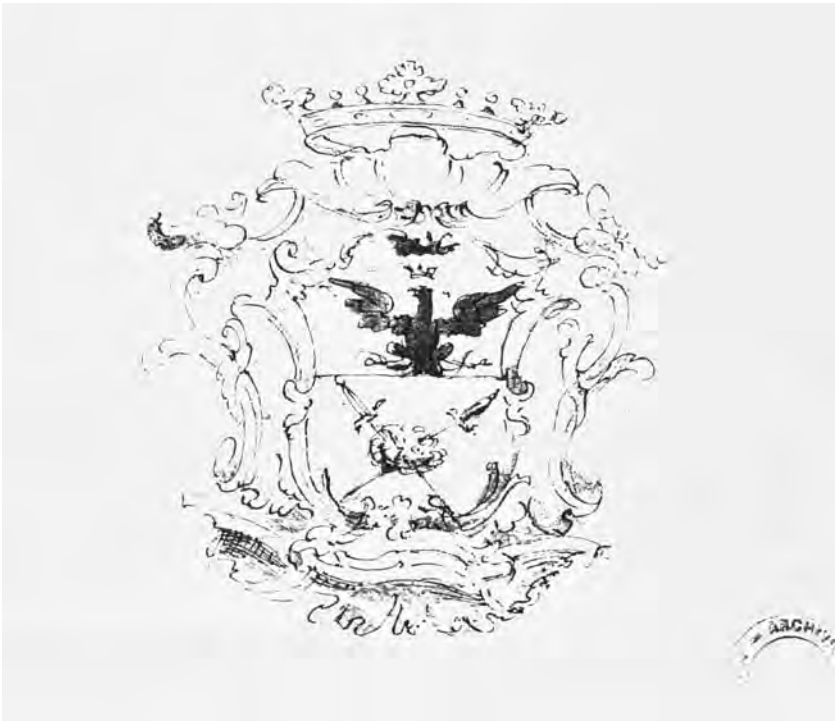
Giacomo and Antonio clearly had serious reservations about Pietro's administrative capability. They had kept him away from the family business—which, in fact, ended in 1739 with Antonio's death—and planned a different career and a different life for him. As one can see from the inventories of their houses, the Agnesi brothers were keen on culture and not afraid to spend on books and paintings, particularly fashionable landscapes and still lifes. Having bought various country villas and palazzi, they had ended up living like nobles. The luxury goods owned by their uncle Giuseppe Mariani, such as ivory-inlaid cabinets and paintings, are also significant in this respect, revealing the aspirations and ambitions of the wealthiest city merchants.[19] Although their perception of their young heir's limited inclination for business probably played a role in the Agnesi brothers' wills, it was not uncommon in this period for the most successful merchants to abandon trade, invest in land, and embrace new lives as rentiers; eventually they might even join the aristocracy at the top of the social ladder.[20] For Pietro, the first Agnesi not to enter the workshop, Giacomo and Antonio envisioned a future as a rentier who might possibly obtain some prestigious office in local administration. As a starting point for Pietro's career, Giacomo had obtained for him the position of *coadiutore* in the Cancelleria Segreta, an organ of the public administration—an office granted by the emperor following an unofficial payment to him of 14,000 lire.[21] In 1722, they also acquired the palazzo at the Pantano for Pietro, along with furniture, carriages, and horses.

Meanwhile, in 1717, Pietro had married Anna Brivio, who gave birth to Maria Gaetana (1718–99), Giacomo Gaetano (1719–pre-1755), Maria Teresa (1720–95), Giuseppa Teresa (?–?), Giacinta Maria (1726–pre-1755), Gaetano Federico (1727–48), and Ippolita Maria (1729–73). Anna died in childbirth on 12 March 1732, plunging the family, and particularly the young Gaetana, into a period of deep mourning. In 1734, Pietro married Marianna

Pezzi, by whom he had two sons: Giuseppe Carlo (1735–1818) and Giacomo Antonio (1736–64). Marianna also died prematurely in 1737, probably from tuberculosis. In the hot summer of 1739, Pietro was preparing to marry Antonia Bonati, who would survive him and who would give him Paolo Maria (1741–pre-1755), Antonio Gaetano (1742–?), Anna Maria (1743–?), Angela Maria (1744–?), Giovanni Maria (1745–pre-1755), Cristoforo Luigi (1746–48), Giovanni Luca (1747–48), Giuseppa Maria (1749–?), Giacinta Maria (1750–pre-1755), Paola Giuseppa (1751–1824), and Pietro Luigi (1752–73). Overall, there are records of Pietro fathering at least twenty-one children; a tax report dated 1755 recorded thirteen surviving offspring. Pietro's wives were all from solid merchant families and brought good dowries, ranging from 12,000 to 18,000 lire. While the surviving sons inherited what remained of the family patrimony, at least four of the daughters entered the cloister (Antonia, Ippolita, Angela, Giuseppa), Maria Teresa and Anna Maria got married, while Paola Giuseppa, the last surviving member of the family, died unmarried in 1824.[22]

The Agnesi's standard of living rose significantly through the 1730s. Pietro increased household expenditure to unprecedented levels in order to sustain what he judged to be an appropriate, quasi-aristocratic way of life for himself and his family. As the Agnesi workshops liquidated their stocks, Pietro took charge of the last of the great family investments, with the primary aim of purchasing the intangible: social status. His main objective was to distance himself and his heirs from his father and uncle's involvement with trade and join the aristocracy through the acquisition of titles and a proper matrimonial strategy. Such a process of ennoblement was certainly possible for wealthy merchants, but the route was long and uncertain: for a family to enter the ranks of the city patricians took at least three generations, the minimum distance to be put between an aristocrat and trade.

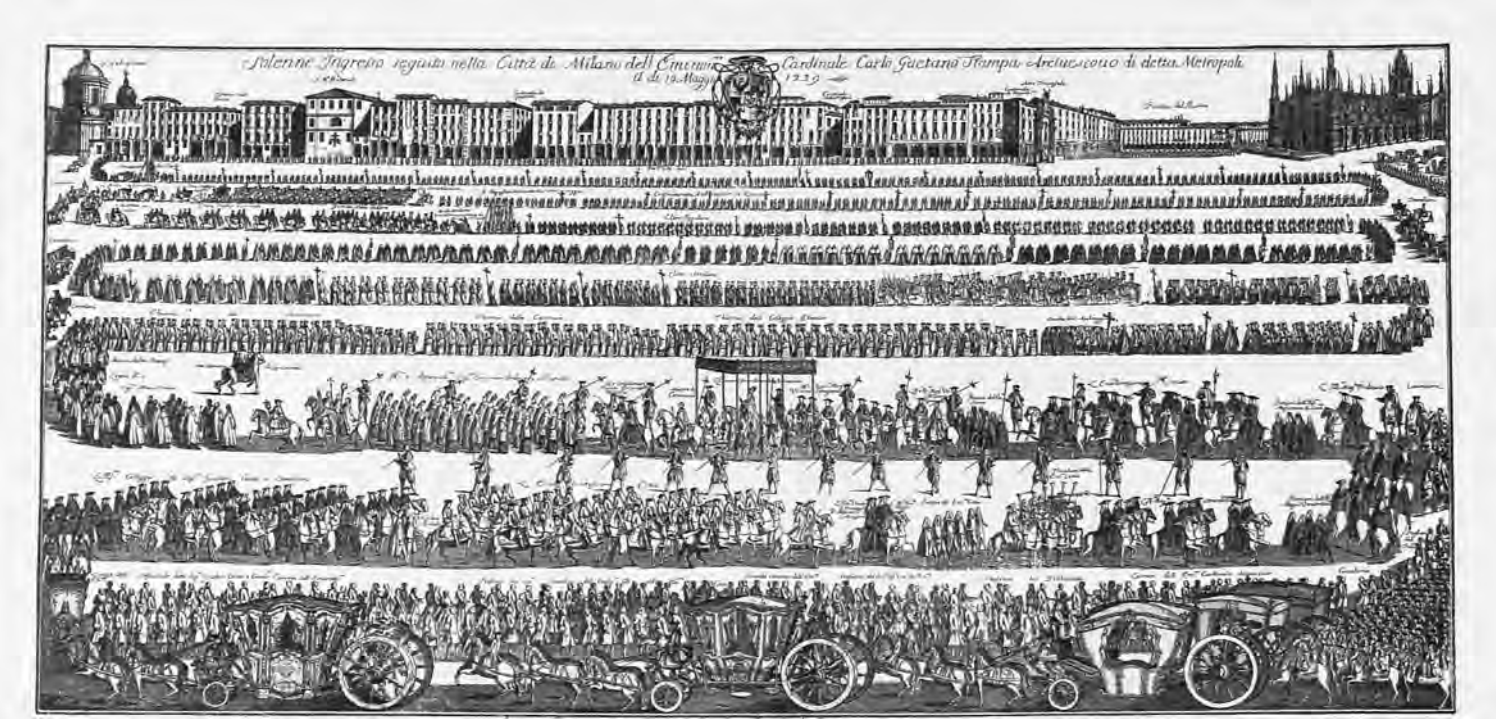
In 1738, Pietro sold his post at the Cancelleria Segreta to a medical officer of the imperial army, a transaction that took place behind the façade of a power of attorney, as selling offices was against the law. Pietro may have considered this position to be of little help to his plans. It did not grant any particular access to the court in Vienna, while real power at the local level remained in the hands of the patrician elite. He decided to follow a different strategy, negotiating the acquisition of an imperial fief that would give him title to a royal feudatory and all the formal rights attached to it, including the right to put "Don" in front of his name. This move would link him directly to the Viennese court, from which he could then expect beneficial



Coat of arms of the Agnesi family (1773). Courtesy Archivio di Stato, Milan (permission no. 31/06, Prot. 7960/ix.5.2).

patronage. While Pietro's ancestors had invested heavily in noble houses and properties, they had not shown any particular desire to enter the nobility itself. This attitude changed with Pietro. The acquisition of the fief of Montevecchia was pursued primarily to obtain the desired title—the family already owned an elegant country villa for vacationing, at Masciago. In fact, not only did the fief not produce any feudal revenue, but negotiations to buy it were not finalized until 1740, when Pietro was already in debt and borrowing money.[23]

The city patricians took little notice of Pietro's new status. It was only after the establishment of the Heraldic Tribunal (1768) that the state of Milan registered the Agnesi in the catalogue of local feudatories and recorded the family crest in the name of Pietro's son and heir Giuseppe (1775). The crest contained references to the imperial concession (the eagle) and to the pre-


Solenne Ingresso seguito nella Città di Milano dell'Eminmo
Cardinale Carlo Gaetano Stampa Arcivescovo di detta Metropoli
il dì 19 Maggio
1739

"Archbishop Stampa enters Milan" (1739). Courtesy Civica Raccolta delle Stampe Achille Bertarelli, Milan.

vious activity of the family (the sponge, though somehow ennobled by two swords piercing it).[24]

It should be noted that obtaining a royal title was very different from entering the city's aristocracy proper. The latter comprised a restricted number of families who had for centuries controlled the senate and the main public offices of the duchy and the state. They also controlled the key positions in the Milanese Church, and had enough influence to impose their own candidate for archbishop on the pontiff. The Milanese patricians had created a formidable axis of power in which the traditional autonomy of the senate and the distinctive liturgy of the Ambrosian Church legitimated and sustained each other. The integration of religious and secular power was effectively represented and reinforced by such spectacular events as the processions for rain that took place in the summer of 1739, which, "rather than revealing the precariousness of existence[,] mirrored the ordered cohesion of the city and the solidity of the social hierarchy." The symbolic funeral for Charles VI (1740) and the triumphal entrances of newly nominated archbishops into the city could also be seen as powerful theatrical representations that mobilized the entire social body.[25]

Typically, Milanese patrician families were perceived as connected to the glories of the free commune of medieval times, their prestige being grounded in their lengthy participation in city affairs rather than in any imperial or royal investiture. Of course, by the mid-eighteenth century, patrician citizens also held a variety of titles obtained at different times from different rulers, while a few feudal families from the provinces had also joined them at the top of the social system. However, prestige and access to power at the local level was still largely based on belonging to the Milanese aristocracy, and the rules of admission to that group were being interpreted ever more strictly. Although descendants of wealthy merchant families could hope to be elevated to the rank of Milanese patricians, for new men like Pietro Agnesi immediate admission was out of the question. In response to this sclerotic situation, Pietro, like many others, tried to bypass the local barriers and scale the social hierarchy by appealing directly to the emperor. Charles VI and later Maria Theresa were certainly inclined to patronize and recompense faithful subjects from the provinces of the empire. The establishment of the Heraldic Tribunal, which would recognize the Agnesi's title, was indeed part of a broader strategy for Vienna to seize control of titles and other status markers, thus undermining the power of the local aristocracy.[26]

The economic burden of Pietro's strategy soon began to weigh on the household. Quite simply, the cost of the new life style and the extraordinary expense involved in obtaining social visibility were higher than the revenue coming from the family's country farms and city houses. Because of the *fideicommissum,* Pietro could not sell any property, so he began borrowing heavily, which wasn't difficult, thanks to the credit the Agnesi family enjoyed. The problem was that Pietro did not pay his debts, which continued to mount until his death in 1752. After that date, most of the family properties had to be sold, and the way of life of the surviving family changed significantly.

Of course, Pietro was by no means the only wealthy merchant who chose to invest so heavily in social prestige. The poet Giuseppe Parini opens his 1763 satirical piece on how the Milanese aristocracy lived by addressing precisely those who had recently abandoned trade to acquire fiefs and titles. To them, Parini ironically offered his service as a teacher of good manners:

> Whether, young sir, thy blood celestial flow
> Most pure by long descent from noble loins,
> Or purchas'd dignities the blood's defect
> Make good by aid of wealth thy frugal father
> Amass'd in few short years by sea or land,
> Harken to me, of pleasant rites the teacher.[27]

Nor was the Agnesi the only family to come to grief. Similar stories are so numerous that a later historian of the Milanese patriciate came to the somewhat comforting conclusion that "the families that have become great by artificial means have generally much less resistance, cohesion, and strength—and consequently a much shorter moral life—than those that became great in a natural way."[28]

The Palazzo Agnesi was flattened during an air raid on the city on the night of 24/25 October 1942, when much of the Pantano neighborhood was also destroyed.[29] Thus disappeared the last traces of Pietro's impressive city house and many other places crucial to his and his family's everyday life. And yet, we have not lost them entirely. The descriptions in this narrative, particularly of the palazzo's rooms and furniture, come from thick files of handwritten sheets produced by notaries after Pietro's death, in 1752. In April of that year, Pietro's possessions were inventoried down to the last

spoon so that they could be priced and sold. These scribbled papers offer an idiosyncratic (and partial) record of Agnesi family life. However, the endless lists of artifacts, careful estimates, coded phrases, word choices, and even the hesitations, mistakes, and corrections can be turned into precious evidence.

First and foremost, these inventories tell us about Pietro's careful and sumptuous staging of the domestic academies that he would organize, either in one of the great salons or in the garden, the latter to be used particularly on summer afternoons. The conversazione at the Palazzo Agnesi was an essential component of Pietro's social "enhancement" strategy, very much like the acquisition of the fief of Montevecchia or the gilded carriages designed to be seen during the afternoon rite of the *corso*. Brosses and Loppin had noticed that members of the Milanese elite rode in their carriages along the Corso di Porta Romana to Porta Orientale and back again, in a series of apparently meaningless circuits. The *corso* was a complex, theatrical parade in which the elite not only vied with one another in the elegance of their carriages and their servants' liveries but also made gentle conversation under the gaze of the commoners. Carriages would stop from time to time to allow their passengers to converse with those in other vehicles. Brosses, like other foreigners, was surprised to see the liberty with which married women would spend afternoons on the *corso* conversing with one or more of their admirers. Regulating the traffic caused by the *corso* remained a constant problem for the authorities throughout the century, as testified by the growing legislation on speed and circulation. Due to the presence of about one thousand private carriages in the city and the highly competitive spirit of cabmen, there was no lack of excitement for onlookers.

Phenomena like the *corso* acquired even greater meaning in periods of war, occupation, and change of rule, which Milan experienced frequently in the first half of the eighteenth century. In those times, the urban elite was eager to affirm and consolidate its power before new and foreign rulers as well as other competing social groups. The decision to parade regularly in a luxury carriage on the *corso* was then less frivolous than it might at first look—not unlike, in fact, buying a good box at the Teatro Regio Ducale, struggling for a significant position in a religious procession, or running a well-known conversazione in the family palazzo.[30]

Pietro supported with enthusiasm and generosity the conversazione that met regularly in his salons. At center stage was Gaetana. According to an anony-

mous sonnet dated 1723, she had begun entertaining her father's guests before she was five,[31] conversing fluently in French and revealing an unexpected quickness of wit in her responses. The sonnet, clearly composed within the circle that gathered under Pietro's patronage, can be read as a celebration of the entire house of Agnesi. It was addressed to "the noble young lady D. Maria Gaetana," thus attributing to her an aristocratic status that, at the time, was only part of Pietro's ambitions. The composition is short, graceful, and witty, quite unlike the pompous tone and heavy Arcadian allegories that were considered suitable in the celebratory poetry of the time. The author ends by declaring that, after talking to this little girl, people would not know whether to believe their eyes or their ears.

In its early stages, the conversazione was open mostly to the local elite: members of the Arcadia Society, professors, senators, magistrates, and ecclesiastics of various affiliation and rank. This was the audience that, in the summer of 1727, gathered in the garden of the Palazzo Agnesi to taste sorbets and hear the nine-year-old Gaetana declaiming from memory a fairly long Latin oration in defense of the right of women to study the fine arts and the sublime sciences. The girl's remarkable performance was received so enthusiastically by the guests that they decided to publish a pamphlet in her honor, which included the oration itself and a series of poetic compositions in various meters and languages. These poems celebrated Gaetana and the female intellect in the convoluted forms of contemporary Arcadian poetry. In contrast, the oration stands out as a clear and effective defense of the right of women to pursue any kind of knowledge. It had been composed in Italian within Pietro's circle, possibly by a private tutor, and Gaetana had translated it into Latin and memorized it as part of her studies.[32]

Pietro had ambitious plans for the obviously talented Gaetana. Through the 1730s, he began using his salon to attract prestigious foreign visitors, particularly those related to the court in Vienna and to the Holy Roman Empire. Gaetana's performances were thus also part of Pietro's attempt to enter the imperial nobility as a feudatory. Meanwhile, Gaetana had been transformed from multilingual prodigy to a learned, eloquent, and combative young woman. By 1739, the twenty-year-old could argue on philosophical and mathematical matters and had mastered the typically masculine technique of academic disputation.

Other remarkable gatherings took place after Brosses visited the conversazione. Early in December 1739, Gaetana and her sister received an urgent message from the city while at their villa at Masciago. It is curious to find

them vacationing at this time of year; however, the two girls spent long periods in the country even during the winter, as Pietro thought they could find a quieter environment for their studies there. The message that now arrived at the villa said that the prince of Braunschweig-Wolfenbuttel would attend a soirée at the palazzo in two days' time, and they were both expected to perform for him. Gaetana later described the evening briefly but effectively in a letter to one of her tutors. She had disputed with renowned academic figures: the Celestine monk Serafino Brancone, a lecturer of theology, and with the Olivetan monk Luigi Stampa, a lecturer of philosophy. They had debated the motion of planets and the nature of colors, their conversation being framed by musical performances. Teresa had played and sung gracefully and had eventually been joined by Gaetana on the viola d'amore. Her letter reveals the rather ironic and detached attitude that Gaetana had developed toward these soirées, which is consistent with her remarks to Brosses about the inappropriate staging of disputations. Less than enthusiastically, she wrote that "everything went according to His Highness' wishes" and that he had enjoyed greatly both the disputes and the music. She wrote that she had played "a very sweet melody with that instrument that borrows its name from love," and about the final duet of harpsichord and viola d'amore, which aimed to make the prince sleep well that night, having filled his eyes with pleasurable visions.[33]

The role of music and the choice of the instruments at the Agnesi conversazione were not casual or arbitrary. From the available reports, one can see that music transformed the conversazione in a theatrical way, guiding it, giving it direction, highlighting passages and breaks, amplifying the symbolic dimension, and providing a signifying background. The harpsichord and viola, like the lute, were traditionally found in aristocratic settings, not only because of their harmonic-contrapuntal capacity but also because of their relation to the body of the performer. Wind instruments were deemed vulgar because their use deformed the face of the performer and impeded graceful gestures; instruments such as the harp and lyre were deemed too simple. The importance of blending musical performance and rhetorical skills was also rooted in a traditional vision of aristocratic education, and was reflected in the pedagogy of contemporary colleges. The ability to play an instrument and sing was considered beneficial for the social prowess of aristocrats, as it increased their visibility and capacity to persuade (*persuasio*); it also helped preserve their inner balance in a deeply dissonant world. Hence, music playing became one of the techniques—artistic, conversa-

tional, rhetorical—that shaped and supported the civilizing action of aristocratic society.[34]

In the latter half of 1739, Pietro seemed to be doing extremely well. He had just remarried happily, was on his way to getting the title of royal feudatory, and his city *palazzo* had hosted an internationally successful conversazione. Then, at the end of November, the "count of Lausitz" entered the city with a large and distinguished entourage and settled in a palazzo magnificently prepared for the occasion by its owner, Count Borromeo. Soon rumors were circulating that the mysterious visitor was, in fact, the young Fredrick Christian, heir to the throne of Poland. Having survived a war of succession (1732–35) against the candidate of the king of France, Augustus III, king of Poland and elector of Saxony, had sent his son on an Italian tour that would last two years.

Count Borromeo, a knight of the Polish Order of the White Eagle, acted as guide for the prince during his Milanese sojourn, accompanying him to luncheons with the governor and with selected groups of "first-rank gentlemen," and on a visit to the city fortress and bastions. Borromeo also brought his guest to various "brilliant conversazioni" and to magnificent events organized by the local aristocracy. These included concerts at the Palazzi Clerici and Caravaggio; soirées of gambling and "pure entertainment" at the Palazzi Resta, Bolognino, and Litta; grand soirées "with wide participation of the nobility" at the Palazzi Simonetta and Pallavicini. Such nightly engagements did not prevent the Polish prince from fulfilling his religious duties admirably. He appeared every morning at the Jesuit church of San Fedele for mass and made sure that, before leaving Milan, he had visited all the main churches and sanctuaries of the city. He took particular care in honoring relics such as the holy veil of the Virgin. Being particularly close to the Jesuits, the prince visited their Milanese house and their college for nobles, where he attended an *accademia* in his honor—that is, a demonstration of the students' ability in the liberal and chivalric arts. This exercise included various displays of their classical education, and also examples of their recitative, fencing, and dancing abilities. As the academy ended, the prefect of the Jesuit house presented the prince with an impressive crystal reliquary containing relics of the holy family and each of the twelve apostles. Not surprisingly, when he left the city, the prince was hailed by an admiring Milanese gazetteer as the ideal Catholic ruler.

A visit to the Palazzo Agnesi was not in the original program prepared

by the city authorities. However, the prince had heard of Maria Gaetana and asked Borromeo to approach Pietro and inquire about the possibility of visiting his house. Pietro received the news with "extreme pleasure" and "thanked his good luck for the honor of hosting His Royal Highness." The visit was arranged for a Friday evening; by dusk, when the prince arrived with a large group of "the most qualified and erudite nobility," the Palazzo Agnesi had been richly adorned and generously lit on all sides by torches. The soirée opened with an instrumental concert, which was followed by Gaetana's disputations with the well-tested Brancone and Stampa. The topics were familiar: the theory of tides and the origin of spring waters. In her elegant Latin, Gaetana defended the opinions of Newton and Vallisneri against an array of objections raised by her opponents. While doing so, a gazetteer reported, she showed once again her competence in mathematics and her "fine taste for modern philosophy." At the prince's request, Gaetana switched to speaking Italian and then conversed with her guests in German, French, and Greek. In between the two disputations, Teresa played some of her keyboard compositions as a relaxing intermezzo. According to the *Gazzetta di Milano,* the prince left the house perfectly satisfied, and he congratulated the city on these two young women, in whom so many rare virtues were joined by such exemplary modesty. Like many of the visitors who attended Gaetana's public performances, the Polish prince was fascinated by the bizarre mixture of academic bravery, debating ability, religious devotion, and virtuous modesty that she displayed. Distant as it was from the French model of the *salonnière* and also from the ideal of a subdued and silent femininity promoted by the Counter Reformation, the public role played by Gaetana had become, by the end of 1739, a fascinating and slightly unsettling attraction.[35]

CHAPTER TWO

Catholicisms

Pietro Agnesi liked to dress elegantly, favoring bright colors and precious textiles such as velvet and silk. His wardrobe was filled with modern-cut tailcoats (*marsine*) and jackets (*giubbe*), which were rather long, in the Parisian style. He certainly had black velvet sets for occasions on which they might be required, but he was normally seen in sets of white, ash-grey, silver, blue, azure, scarlet, or dark red (*rosso sangue*), most of them embroidered with silver and gold arabesques. His tailcoats were enriched by frogs and braids, a specialty of Milanese artisans. With friends at home, he would normally wear lighter silk jackets in various shades of green, decorated with floral patterns.

Pietro's outfits must have stood out in Milan, where the older aristocracy was used to dressing in a relatively simple and understated way. The clothing in the aristocratic portraits of the 1730s is still reminiscent of the austere and black-dominated fashion of the seventeenth century, when the city elite was bound by the rituals of Spanish etiquette. Indeed, high-ranking magistrates were still proudly exhibiting their Spanish robes as if the 1707 change of power from Spain to Austria had never occurred. Apparently the distance from the court made modifying their dress code less relevant for the Milanese elite, so much so that, when the new governor, the Prince of Löwenstein, arrived in 1717, the Milanese authorities organized a visually stunning representation of social order through an impeccable, though not much appreciated, Spanish ceremonial.

A general reorientation of taste among the Milanese elite became apparent only toward the end of the 1730s, with French fashion becoming increasingly popular. This meant longer jackets, lighter colors, and plenty of gilt decorations. In this rush to dress conspicuously, the patrician elite could be equaled or even surpassed by wealthy bourgeois like Pietro. Hence the

attempts by the local authorities to enforce specific regulations that prevented the members of families like the Agnesi from dressing too ostentatiously and forbidding the women from using pages to carry the trains of their dresses. The elite considered restricting the consumption of luxury items as key to their mercantilist policy; it also preserved the meaning of these items as markers of social status.[1]

Unlike French fashion, a proper education for his children was something that a new man like Pietro could not easily buy. In fact, it was unusual for wealthy families, even among the aristocracy, to invest in educating many of their children, let alone girls. But Pietro did fund the education of his children generously, and he was attentive in spotting their abilities and helping them to make the best of them. Since infancy, the Agnesi children had been taught by private tutors, their progress followed by the professors and ecclesiastical scholars who frequented the house and enlivened its conversazione. As they reached their teens, the boys entered religious colleges while the girls continued their studies at home under the supervision of the best available tutors. Apparently it was one Abbé Niccolò Gemelli who first noticed Gaetana's remarkable talent for Latin. He had been hired to teach the classic languages to her younger brother Giacomo and prepare him for early entrance to college. It turned out that Gaetana was able to memorize an impressive proportion of the lectures just by overhearing them while playing in the same room as her brother. Pietro reacted to the news promptly and asked Gemelli to take the girl under his wing until he could find other qualified tutors to teach her. It was under the tutelage of this *abbé* that, in the summer of 1727, Gaetana translated and declaimed a Latin oration in defense of the right of women to study the arts and sciences without any limitations. A lawyer by the name of Ludovico Voigt, later a teacher at the public schools in Milan (*Scuole Palatine*), first introduced Gaetana to the elements of German and Greek.

Meanwhile, Pietro's firstborn son was sent to the College of San Giorgio at Novi, a prestigious institution run by the Somaschan fathers. Prestigious, that is, among those that would accept commoners as their boarders.[2]

The educational institutions of the peninsula went through major reshaping during the early modern age. New elites and new political forms emerged from the crisis of the republican institutions of the Renaissance city-states. These centered on the figure of the prince, and were constituted

by a political discourse that replaced, as the supreme political virtue, the citizen's justice with the prince's prudence. This process of aristocratization of the ruling elites concentrated power in the hands of city-based oligarchies, usually a small number of patrician and feudal families. While constructing their identities in a mythical continuity with the tradition of the medieval communes, these elites institutionalized a series of mechanisms for the exclusion of other competing social groups from the exercise of power. This created an inversion of the trend of upward social mobility that had characterized urban life in the Middle Ages, and penalized, in particular, urban merchant groups—in Milan, most of these were wealthy merchants of gold, silver, and silk. Their opportunities to enter the administration, the magistrature, and the most prestigious professions were eroded by increasingly discriminatory legislation.

Two things were key to the success of this process of exclusion: first, parliamentary seats were transformed into hereditary privileges reserved for the firstborn of senatorial families; second, a new and exclusive kind of schooling was created for the sons of the ruling elites. These institutions were the Jesuit colleges of education for the nobility (*seminaria nobilium*), which, from the late sixteenth century, functioned effectively as instruments for the reproduction of Catholic elites worldwide. Initially distributed strategically to fight the propagation of the Reformation, they soon covered Catholic countries homogeneously, mostly through invitation and at the expense of the local elites. By 1749, there were a staggering 669 of these colleges.[3]

Although inspired by the university colleges of medieval origin, the Jesuit institutions introduced new, crucial elements such as a regime of continuous surveillance and complete control over their pupils' lives and education. Abandoning the former tradition of self-governed student associations (*modus italicus*), the new colleges enforced a rigid principle of authority and excluded a priori any participation of the students in the governing of the school (*modus parisiensis*). Curricula were substantially revised to serve at best the specific social function of the college. Among the most important innovations were: the introduction of an ordered sequence of classes, basic scholastic units in which the level of instruction was the same for all pupils; an ordered sequence of lectures, repetitions, and exercises; and the designing of specific textbooks and readers. The average age on entrance was ten or eleven and at departure sixteen or seventeen, although students as young as seven could be accepted.[4]

Milan was the first Italian city to host one of these boarding colleges for the nobility, beginning in 1574. The college had been created in the context of a broader Counter Reformation strategy and quickly acquired a solid reputation, its recruitment outreach stretching from Austria, Poland, and Hungary to Bohemia. It did not accept pupils from merchant or artisan families, and proof of two or three generations' worth of "not ordinary" noble status had to be given. Indeed, for those families who had only recently entered the patrician elite, having their children accepted in one of these colleges was a significant achievement. In France, by contrast, the demographics of pupils at Jesuit colleges varied widely, and in some cases, the majority of students were not from an aristocratic background. Such diversity was symptomatic of a more fluid social structure in which the demarcation between those groups that could live like the nobility and those who held on to political and economic privileges was less rigid. In 1717, the acceptance of the son of a cotton merchant from Bergamo, "of low condition, although wealthy," at a north Italian college for nobles evoked "horror" among other boarders. In 1726, in fear of possible retaliation by the Milanese aristocracy, the same college rejected the application of a son of a Milanese banker who had recently received a royal feud from Charles VI. As late as 1762, the Milanese Duchessa Serbelloni agreed to send her son to study in Vienna only on condition that he did not attend the same college as the sons of a well-known Milanese entrepreneur.[5]

Pietro was well aware that his family had just begun a long and difficult transition in social status and that at this stage there was no hope that a college for nobles would accept his sons, so he thus decided to send them to colleges run by the Somaschans, who were keener to cater to diverse social groups. As for Gaetana, that was a different matter, of course; her entering a college was not even an issue. Pietro decided to organize and fund a private program of study for her that was, in fact, an interesting variation on the traditional Jesuit curriculum. Its content was close enough to be recognized as legitimate education, but as we shall see, it also differed in some essential aspects. It is therefore important, before moving to Gaetana's studies and accomplishments, to take a closer look at the Jesuit curriculum and its pedagogical methods.

Jesuit colleges were designed to produce well-educated and socialized Catholic gentlemen. They catered to two basic kinds of student: the firstborn, who would inherit political and economic privileges, and their brothers. For

the former, the college was primarily a place to acquire relevant social skills; for the latter, it also offered the opportunity to learn enough to pursue a career in the bureaucracy, the army, or the Church. This dual purpose shaped both the teaching content and the teaching methods.

Studies began with two biennial cycles during which the younger students were taught catechism and the first rudiments of Latin. Arithmetic and the vernacular languages were essentially ignored; Greek grammar was not compulsory, although it was a popular option. The next stage was the first grammar class, where half the total teaching time was devoted to the study of Latin. Exposure to the logical structure of Latin grammar was thought to mold each student's *forma mentis* (mind set) appropriately—the content of selected texts would inspire him to cultivate the aristocratic virtues, while the style and rhetoric techniques would enter his repertoire and serve him in his future public life. The student was expected to fully master Latin and use it as a matter of course; addressing a teacher in the vernacular during a lecture was a sanctionable offence. Cicero's works constituted the backbone of the readings; other favorite authors were Ovid, Curtius Rufus, Seneca, a properly purged Martialis, and Virgil.[6] Cicero was appreciated because of his pure style and his eulogy of the aristocratic virtues, particularly in *De officiis*. In the humanities class, students were trained in the art of eloquence, based on the careful study and imitation of the classics through sophisticated mnemonic techniques. The rhetoric class concluded the first cycle of study. Here students learned to compose orations, discourses, and poetry. They also read Statius, Livius, Persius, Lucan, and Caesar at this stage. Their religious education was based on specific dialogical catechisms, such as Roberto Bellarmino's, and was integrated into the rest of the teaching.

For those willing to continue their studies, the college offered two advanced courses, philosophy and law, in direct competition with the universities. Philosophy included classes in logic and physics, which were based on Aristotelian texts—although in the eighteenth century, they could also refer to experimental physics and modern mathematics. In the third and last class, students were taught metaphysics and moral philosophy.[7]

Classwork was only part of the educational process. Because of its dual function as an instrument of both instruction and socialization, the college integrated its teaching with religious practice and the cultivation of the "chivalric sciences." These were framed in the activities of, respectively, the Marian congregations and the internal academies. The academies were run

by the best students; they organized facultative activities and stimulated competition by means of disputations and contests and the distribution of medals, prizes, and privileges. The *accademia* staged in 1739 by the boarders of the College of Brera for the Polish prince is a typical example. Similar events would be organized for a variety of reasons, including religious holidays and commemorative functions. Thus, for example, the funeral mass of the natural philosopher Manfredo Settala (1680) was followed by an *accademia* consisting of a theatrical exhibition of marvels from Settala's museum seen via a series of allegorical tableaux representing the most important moments of his life and work, while in the background, selected boarders read aloud specially commissioned Latin poetry.[8]

A college could teach up to fifty different chivalric disciplines, which included military exercises such as fencing, pike, and flag, and also the study of modern languages and literature (French, German, Spanish, Italian), music, chanting, and dance. Great care went into the teaching of musical instruments, with students' preferences being the violin, mandolin, and viola d'amore. In the 1730s, the harpsichord's popularity was also on the rise. Pupils could take courses in history and heraldry, the latter to be studied down to its technical details. Those who intended to pursue military careers studied geography, in association with fortification, algebra, geometry, and perspective. At a time when military academies were still rare, the Jesuit college provided the technical training required for prospective high-ranking officers.

Together with music, the most characteristic extracurricular activities were theater and dance. Jesuit baroque theater was renowned for its sumptuous choreography and scenic apparatus. The pieces were rich in transparent moral teachings, from the extolling of the aristocratic virtues to the celebration of free will and individual responsibility. This was not, however, the only reason why dramatic training was considered essential to the education of a Catholic gentleman. For one thing, participating in the dramatic action reinforced in him certain attitudes and channeled his emotions and fantasies along well-defined routes. The shaping of reason carried out in the class could thus be coupled with an effective shaping of the imagination. Moreover, acting imposed a strict discipline on the student's body, forcing him to develop complete control over his movements, so that he could learn to calibrate them with extreme precision. To the future ruling elite, the control of the body, the careful modulation of the voice, and the appropriate gesture were no less important than erudition and eloquence. Dancing also

helped to refine the student's motor skills. The Jesuits created primarily allegorical ballets to be used as intermezzi during theater spectacles, and by the turn of the seventeenth century, salon dances such as the fashionable minuet were also commonly taught in their colleges. Here, as in other cases, the moralistic prohibitions of Loyola's original *ratio studiorum* were ignored in favor of mastering practical techniques that, together with rhetorical techniques, imagery, and ways of thinking, fashioned the Catholic nobiliary identity.[9]

Pietro had just paid for the publication of a celebratory pamphlet containing Gaetana's Latin oration when he heard that the well-known professor, pedagogue, and priest Girolamo Tagliazucchi (1674–1751) was in Milan. The former secretary of the duke of Modena and a professor of Greek and Italian literature at the College of San Carlo, Tagliazucchi was now available to take private pupils under his supervision. Pietro asked him to guide Gaetana in her studies of Greek, Latin, and rhetoric, welcoming him "with plenty of honors and rewards."[10]

Tagliazucchi paired an austere Catholic devotion with a taste for the stylistic simplicity of the Augustan age. In reaction to the artificial Italian poetry of the seventeenth century and the late-scholastic Latin of contemporary philosophy, he had his students reading and imitating the language of Dante, Petrarch, Boccaccio, and Castiglione; among the classics, they would translate Homer, Virgil, Horatius, and Cicero. Tagliazucchi was outspoken in his dislike for later Latin authors such as Statius, Lucan, Seneca, or Tacit, whose language owed too much to the artificial, the curious, the overly complex, and the idiosyncratic. Bad taste (*cattivo gusto*), he maintained, was simply the product of bad reasoning. This argument was reinforced further by appealing to nature: the style of the Latin golden age and sixteenth-century literary classicism would be natural and, as such, opposed to any artificiality, or what Tagliazucchi would scornfully call "the style of the appearance" (*apparenza*). His vehement campaign against what we could define as baroque taste in literary matters was obviously targeted at the curriculum of Jesuit colleges, and it provoked bitter reactions.

Tagliazucchi grounded his pedagogical methods on certain suggestions from Cartesian philosophy and the basic tenets of Christian anthropology. His precepts, examples, and exercises aimed primarily at training the pupil's reason—that is, enabling him to compare, combine, and take apart ideas. Reason, Tagliazucchi maintained, is the superior faculty of the hu-

man mind, which understands, reflects on, judges, and wills. The inferior, or animal, part is a mere instrument of superior reason and is designed to feel, imagine, and desire. It is a consequence of original sin and the subsequent fall of the human condition that this inferior part of the mind resists the precepts of reason. Hence the importance of a correct, balanced education to mold the civil and religious conduct of human beings.[11]

Tagliazucchi took great care in developing his students' analytical faculty (*l'analitica*), by which he meant their capacity for abstraction. This was the mental process through which human reason produces "a formula or canon that includes all possible particular cases." Such a broad use of the term *analysis* was current in the eighteenth century, when it could refer to a variety of processes and practices, inside and outside the realm of mathematics. This fundamental way of thinking, Tagliazucchi argued, is particularly difficult for young students to acquire, and a great deal of the teacher's ability lies in shifting continuously from the general and the abstract to the particular and the concrete. It is only by building on what is known and familiar that the student can acquire higher analytical abilities. The best examples of this are provided by algebra and geometry: no other discipline needs such an intense use of reasoning, and still, when properly trained, even very young students can make "marvelous progress" in these disciplines. Tagliazucchi wrote these last words as Gaetana, aged fifteen, was proceeding rapidly through her studies of mathematics.[12]

When moving from geometry to the humanities, Tagliazucchi's didactic method did not change significantly, and the same basic guidelines informed his teaching of Italian, Latin, Greek, poetic composition, and the techniques of rhetoric and eloquence. For these last, he rejected the Jesuit methodology based on mnemonic techniques. Instead, the teacher should exercise the student's reason, that divine gift that must enlighten and guide all human endeavors. In this way, one would produce reasoning students rather than "parrots."[13]

Tagliazucchi's language is still largely scholastic: pure intellect has the power to abstract from impressions obtained through the senses and, in this way, reach a true understanding. The teacher guides students from the senses to the intellect and back again until their ideas are clear. Tagliazucchi's practical conclusions, however, were rather less conventional. Teaching should be done in the vernacular, he maintained, as their native language is obviously more familiar and concrete to students. Also, when translating from other languages, the students should not be literal but

should rather try to achieve the original intention of the author in a form that is more appropriate to the spirit (*genio*) of the new language—that is, to its typical grammatical structures, linguistic constructions, and figures of speech. And what better way to absorb the spirit of a language than by reading repeatedly those authors who use it in its purest and most rational form? It followed that, while reading and imitating Cicero was essential for "impressing" the properties of the purest Latin language on the student's mind, most of the other classical authors could be easily skipped. Tagliazucchi's teaching also focused on the fine mechanism of rhetorical speech and the art of disputation. However, he judged the typical Jesuit rhetorical and compositional exercises to be full of useless sophistic subtleties, and he aimed to eradicate those trends in modern teaching that valued, above all, extravagant metaphors, amplifications, and linguistic affectation. For Tagliazucchi, these were at once esthetically unpleasant and morally contemptible. Instead he thought that orators should aim for evidence in their discourse in the same way that geometers do. Such a humble and straightforward cognitive attitude would also benefit spiritual life. The divine gift of intellect must be properly trained and used so that human beings can best fulfill their earthly duties, both civil and religious. "Where there is little light," Tagliazucchi wrote, "our physical eye is impaired; where there is little knowledge our spiritual eye [*l'occhio dell'anima*] is impaired." Keeping the mind idle or employing it in sophistic arguments rather than in the pursuit of truth was tantamount to committing a grave sin.[14]

For all his reformist zeal and inclination toward empiricist epistemology, Tagliazucchi was not willing to give way completely to the spiritual and metaphysical assumptions that permeated continental philosophy at the time. While conceding that reason and nature are the two principles of our understanding, he also claimed that all they do is to make us aware of ideas originally impressed upon our minds by God and of their sublime order. Created things offer to human beings occasions for inner contemplation that can help them to discover the truth. His platonic approach to the nature of knowledge and his support for innate ideas made Tagliazucchi read and admire such spiritual Cartesians as the Oratorian priest Nicolas Malebranche. From the latter's writings, Tagliazucchi borrowed the notion of "attention"—the ability to concentrate that is a prerequisite to the investigation of nature. Training the intellect to be attentive and sharp was a precondition for the discovery of truth and therefore also a valuable form of natural prayer. Thus, while undermining traditional didactic methods and many of

the traditional elitist assumptions on which they rested, Tagliazucchi defended a teleological vision of the cognitive faculties and an orthodox reconciliation of modern knowledge and religious dogma.[15]

It is not too difficult to see why someone like Pietro would find this perspective on knowledge and pedagogy particularly appealing. For one thing, Tagliazucchi was talking to the members of what he liked to call the "true nobility," which did not necessarily coincide with blue blood and the patriciate. In fact, he held "the great and noble of Italy" responsible for the widely perceived decline of poetry and science on the peninsula. Tagliazucchi scorned the didactic methods of Jesuit colleges and offered a more rational and effective program of study to his clients. The new nobility (of the spirit, that is) should then impose on itself the task of setting up societies to promote a cultural renewal along the lines of good taste and a reasonable, antibaroque Catholic devotion. Granted, its members were expected to be reasonably well-off, as Tagliazucchi admitted that educating children was not cheap. However, he recommended investing in children's education rather than "throwing [money] away on many frivolous, useless, and often dangerous things." He was crystal clear that he was offering a valuable commodity, and the rules were those of the market. "I have done like merchants used to do at fairs," he wrote. "Everybody displays their merchandise, buyers look at it all, and then buy the things they think are best."[16]

Under Tagliazucchi's supervision, Gaetana refined her oratory abilities and her Ciceronian style—both highly valued skills, the acquisition of which was normally forbidden to women. Gaetana's bold attitude when disputing on philosophical matters and her debating skills surprised Pietro's guests, not because they were unusual—college boarders spent much of their time acquiring them—but because they were being displayed by a woman in a conversazione.

As for the method of Gaetana's early studies, we can take a look at her surviving manuscripts and letters. Among her early notebooks are a couple with lists of Latin terms and their Greek translations, one with Hebrew terms and their Latin translations, and one with the first two books of Johann Freinsheim's supplements to Curtius Rufus's *Life of Alexander;* Gaetana translated the second into Italian, French, German, and Greek. Pietro bought vocabularies and grammars but there are no traces of grammatical exercises or rules in Gaetana's notebooks, which suggests that most of her teaching was based on the direct reading of classical authors. Among her

exercises is a translation from Latin to Greek of a lecture on the origin of ancient mythologies. While showing the symbolic meaning and natural causes of ancient cults through a "*recta philosophandi ratio*," these brief notes maintained that an ancient wisdom of divine origins can also be detected behind them. Similar beliefs were derived from the doctrine of the *prisca theologia*, a resource that could be effectively employed to defend the primacy of religious over natural knowledge.[17]

Toward the end of 1730, Gaetana received letters from her tutor Lodovico Voigt from which we gather that she was suffering from a mysterious and "persistent" malady.[18] This was indeed a critical period for the girl who, in addition to the strain caused by repeated public performances, had seen the departure of her favorite tutor, Tagliazucchi, now a professor of eloquence and rhetoric at the University of Turin. The death in childbirth of her mother, Anna Brivio, in March 1732, exacerbated Gaetana's condition. The physicians advised Pietro to send the girl to his country villa at Masciago, attributing her malaise to intense study and a sedentary life. Gaetana became very passionate about riding and dancing, but these new activities did little to improve her condition. She frequently fell victim to violent nervous attacks during which she had to be immobilized to prevent her from hurting herself. Her "convulsions" eluded any diagnosis or treatment; on occasion, the house servants managed to restrain her "only with a great effort." The description we have suggests a form of chorea; but there is also the report of an episode that resembles a suicide attempt. We have no additional information about her life until 1733, when she had apparently recovered and was back at her studies.[19]

In 1733, Gaetana's then tutor Manara wrote to her from Rome congratulating her on her advances and answering certain questions about mixed mathematics. However, the days when this girl had amused her father's guests with her polyglot performances were over. Her biographer reports that her "cunning father and the numerous circle of learned friends that frequented his house decided unanimously to let a girl of such promise enter freely the vast territories of philosophy and mathematics." In moving from the study of eloquence and languages to that of philosophy, her curriculum was mimicking that of the Jesuit schools. Pietro had decided to invest seriously in the talented girl and let her have an education that would be as close as possible to that imparted by the best colleges. Her tutors were chosen accordingly.[20]

Count Belloni, the erudite and well-mannered patrician from Pavia, coached Gaetana in disputation techniques and on matters of etiquette. He also made sure that she would study geometry and algebra up to Guillame François de l'Hospital's treaty of curves, and he later introduced her to Isaac Newton's *Opticks* and *Principia mathematica*. As emerges from their correspondence, Belloni was an intimate friend of the Agnesi family and would spend long periods in their country villa during the summer. In recognition of his tutoring and guidance, Gaetana would dedicate her first proper publication to him. The roster of Gaetana's tutors included other remarkable figures: the Somaschan priest Francesco Manara, the Celestine monk Serafino Brancone, and the Theatine priest Michele Casati. These scholars contributed in various ways to her program of study in natural and moral philosophy. A professor of logic in a Somaschan college, Manara would soon obtain the prestigious chair of experimental physics at the University of Pavia, and he would also reach the position of general of his own congregation. Brancone would become a bishop and a professor of natural philosophy at the University of Naples. Casati would soon move to Piedmont at the invitation of the ruling house of Savoy and contribute, like Tagliazucchi, to the reform of the educational system in that kingdom. In return for his services, he was made a bishop and given a university chair in moral philosophy.

Clearly, Pietro was not relying on ordinary tutors. On the contrary, he made sure that his talented daughter was guided by prominent figures on the contemporary philosophical scene. Belloni excepted, the tutors were all ecclesiastics. Wealthy families would typically employ secular priests to tutor their children, but Pietro was not hiring the typical *abbé* with a less-than-certain vocation. Instead, his employees were, like many of the people who frequented his house, influential preachers and theologians who would reach the heads of their congregations. All were actively involved in debates over contemporary religious and educational reform.

Gaetana's literary and philosophical tutoring was coupled by careful spiritual assistance, which went well beyond the usual catechisms or standard piety books for the adolescent. The Agnesi were good and generous parishioners of the ancient basilica of San Nazaro, as the Brivio—Gaetana's maternal grandparents—had been before them. Alfonso Brivio and Angela Gazzola had married under its vaults in 1697, and there, in 1717, Pietro married their daughter Anna. Pietro then joined the Brivio household tem-

porarily, which is why Gaetana was born in their house, on Vicolo Santa Caterina, a few meters from the basilica, and was baptized in the marble font to the left of the entrance. For at least three decades, it was the words and gestures of the San Nazaro priests that had given meaning to crucial moments in the lives of Brivio and Agnesi family members, and their dead rested under the stones of that church.[21]

However, this unremarkable pattern shows some interesting irregularities. In 1725, when the time came for Pietro to choose a spiritual director for his gifted daughter, he did not choose the canon of San Nazaro or one of the parish priests, as would have been normal. Instead, Gaetana's spiritual life was to be nurtured by a priest of the Theatine congregation, which had its Milanese house near the church of San Antonio Abate, in the Pantano quarter. Giuseppe Maria Reina would remain Gaetana's spiritual director until his death in 1750. Reina had completed his philosophical course in San Antonio in 1701 and been a teacher and an examiner of the novices in the Milanese house of his congregation, where, in 1733, he would become the principal.[22] When Gaetana's mother died in March 1732, her body was taken to San Antonio instead of San Nazaro, and thanks to special permission from her official parish, she was buried there following a solemn funeral service.[23] In 1737, Marianna de Pezzis, Pietro's second wife, died of consumption at the age of twenty-three; again, it was the Theatine priests who officiated at the funeral mass.[24] Other Agnesi would be buried in the Theatine church, including Gaetana's maternal grandparents in 1740 and 1751—which suggests that the association with the Theatines lasted at least until Pietro's own death.[25]

Further traces of the Theatine devotional practices among the Agnesi are to be found in the report of Gaetana's recovery from the mysterious condition that struck her down between 1730 and 1732. We are told by her biographer that the physicians had failed to cure the malaise and that Gaetana's adoption of Theatine spiritual exercises and the cult of their founder and patron saint, San Gaetano di Thiene, eventually restored her to good health. It was probably following this miraculous healing that a portrait of San Gaetano was hung in her bedroom—a painting that Gaetana would jealously preserve for the rest of her life.[26] Her own name and those of two of her brothers are clear testimony to a family devotion to the saint that dated back to at least 1718. Interestingly, the gazettes report that, in May of that year, the Theatine fathers held magnificent celebrations in San Antonio on the first anniversary of the foundation of the Congregation of the Perpetual Ado-

ration of the Most Holy Sacrament, which already comprised two hundred members. On that occasion, the Eucharist was exhibited "upon a tall and majestic machine" and the benediction was imparted in a nocturnal celebration that attracted "innumerable people," lit as it was "by the greatest number of lamps" and accompanied by sacred music. This particular devotion, championed by San Gaetano himself, had been spread by Theatine priests throughout the Italian and Austrian territories and enjoyed the public support of the emperor and his family. The devotion and the religious practice associated with it became an important link between the new ruler and those groups within the city that aimed to obtain his patronage, with the Theatine church as a privileged site of mediation. Gaetana and her brother were only two of a number of newborns who were given the name of the Theatine saint in those years.[27]

The Theatine priests, who were assiduous frequenters of the Agnesi conversazioni, provided the family with pastoral and spiritual guidance. Father Reina, well aware of Gaetana's abilities, introduced her to the texts of Theatine spirituality as early as 1725. Apparently, in that year he edited a version of a short essay titled *Avvertimenti spirituali* by Andrea Avellino (1521–1608), an early Theatine and a saint of the Church. This Milanese edition was dedicated to Gaetana. "I considered this work," Reina wrote in the dedication, "most apt to your spirit, which is equally provided with light and piety well above your age."[28] Through Avellino's instructions, Gaetana was introduced to the austere Theatine spirituality. Avellino told upper-class ladies that it was essential to live in contempt of themselves and the world. He recommended complete submission to superiors—including fathers—who should be obeyed "in everything that does not offend God," because "every authority is just and holy."

The life of the believer was, to Avellino, a continuous and dramatic "combat between flesh and spirit," a theme that was developed in a more substantial and famous text by his disciple Lorenzo Scupoli in *Combattimento spirituale* (1589), which would remain a constant reference in Gaetana's later religious and moral reflection.[29] The *Combattimento* is a key text of the Counter Reformation as it took shape in Milan under the charismatic leadership of Archbishop Carlo Borromeo. Borromeo called on the Theatines to support his actions, and their church, with its single nave and barrel vault, remains an imposing example of the Counter Reformation basilica of the late sixteenth century.[30] The text of the *Combattimento* had originally been

prepared for the nuns of the monastery of San Andrea in Venice, hence its addressing readers as if they are women. Gaetana owned an elegant edition printed in Padua in 1724, by which time there were more than two hundred editions in a dozen languages, spreading across both Catholic and Orthodox lands.

The *Combattimento* was designed as a course of spiritual strategy: the military metaphor pervades the text, from the title to the dedication to Christ as "supreme captain" to the descriptions of the fighting, the wounds, and the final destruction of the enemy. Scupoli had little time for theological subtleties. His style is direct and far from sophisticated. He was offering readers weapons for the essential combat—that is, their superior faculties, intellect and will—against their own weaknesses and corruption. The image of the combat emphasized the dualistic perspective of traditional Christian anthropology. It portrayed humans as the battleground of opposite forces, reflected in the dogmas of original sin and baptismal regeneration: on the one hand, the disordered and self-destructive domain of senses and passions; on the other, the well-trained intellect that can guide the will to achieve a perfect spiritual life. Fathers of the Church such as Augustine and Cassianus had elaborated on this theme, summed up in the exhortation *te vince et mundus est victus* (conquer yourself and you have conquered the world). However, the motif of the combat against self-love and ambition (*amor sui*) became a distinct part of Counter Reformation spirituality and of the Theatine type in particular. Scupoli described this fundamental tension as the struggle between the "two wills": the superior, which aims toward God, and the inferior, which is chained to the senses. The final prize he promised to the "spiritual soldier" was the highest spiritual achievement: the beatific vision of God and the particular state indicated by mystical theology as the "transforming union" of the soul with its creator, when they "become the same spirit."[31]

The Catholic Scupoli celebrated the freedom of the will at length, but at the same time he warned against its dangerous implications. He denied that the ostentatious practices of penitence, vocal prayers, or even monastic isolation would be enough to perfect the spiritual life of the believer. What was needed was a "continuous and relentless struggle against [one]self." The believer's weapons were profound humility (*diffidenza di sé*), theological optimism (*confidenza in Dio*), the exercise of the intellect and will (*esercizio*), and meditation and prayer (*orazione*). Most of the *Combattimento* is devoted to a careful description of exercises designed to train the intellect and will

against the deception of passions and senses. It should be noted that the intellect—"the eye of the soul," the same expression we find in Tagliazucchi—is not contrasted to the will or to Christian faith. The first series of exercises are, rather, intended to strengthen the intellect, making it more "lucid and clear." Only a clear intellect can guide the will to the perfect spiritual life. Essentially, the intellect needs to be freed from the pollution of the appetites in order to see things as they really are. Negligence and idleness, both physical and mental, are the most dangerous vices; they "infect" the will and "blind" the intellect. The light of the intellect needs to be free and clear but also focused on those spiritual ends that are proper to it. Exercise your intellect, Scupoli wrote, "as if you were dead to all unnecessary earthly matters." Thus, in natural philosophy, the believer should always operate the intellectual act by separating the physical from its spiritual meaning and elevating the mind to the contemplation of its creator. Scupoli was referring to a mental practice familiar to churchgoers—the contemplation of objects related to the passion of Christ (such as the column, the nails, the rope) or of their pictorial representations—intended to facilitate meditation on the holy mysteries. Indeed, he describes a series of meditation techniques based on the contemplation of moments from the passion (*sequela Christi*), the participation in Christ's suffering, the imitation of his pure love, and the final self-annihilation in the divinity. The believer, according to Scupoli, should extend the use of such techniques for the control of feelings and imagination to the entirety of their everyday life.[32]

During the first half of the eighteenth century, Scupoli's spiritual exercises and the Theatine tradition became important resources for those critical of baroque religiosity, who aimed to reform Catholic devotional practice. In 1712, the diocese of Milan celebrated magnificently the canonization of Andrea Avellino, and on that occasion, a chapel was erected in his honor in the church of San Antonio, facing the chapel of San Gaetano. These two chapels became privileged sites of prayer and meditation for members of the Agnesi family. By 1739, Avellino had been enlisted as protector of the city, and his and Scupoli's works had been reprinted in their entirety. In their pages, one would find the call for a stricter religious discipline of the clergy, moral rigor, and the devaluation of a merely exterior religiosity. If spiritual combat was a distinctive feature of Theatine spirituality, so was its reinterpretation of the quest for poverty and detachment from the world, in the spirit of the primitive church. Not only could Theatine priests not possess temporal

goods, but they had to refrain from asking alms. The congregation itself was deprived of any regular income.[33]

The Theatines aimed to return to what they believed was a simpler and purer form of religious devotion. Their theological sources are to be found primarily among the fathers of the Church and in the Augustinian and Thomistic traditions. These roots were celebrated visually in a portrait of Avellino entreating Augustine and Thomas to intercede for enlightenment and wisdom, now at the church of San Paolo Maggiore in Naples. The industriousness and ascetic spirituality of congregations such as the Theatines shared common traits with the reformist ambitions of other devout literati, mostly ecclesiastics, who met regularly at the Agnesi conversazioni. They also believed that intellectual exercise was essential to spiritual life and were hostile toward Jesuit theology and pedagogy. The damasked salons of Pietro's house hosted a conversazione in which discussions on the renewal of education, knowledge, devotion, and liturgy converged in the making of a new, enlightened Catholicism.

The appearances of the female prodigy Gaetana at Milanese conversazioni were made possible by a network of political, religious, and cultural alliances. The publication of her 1727 public oration was indeed emblematic of the connection between religious reformers and groups struggling to emerge from political marginalization—both eager to obtain the patronage of the distant emperor. Gaetana's original performance had given Pietro's conversazione the desired visibility and put it on the map of the Milanese *bel mondo*. The dedication of the booklet to the Theatine Agostino Tolotta (1688–1762) signified the proximity of the family to the religious reformism of that congregation and to its ascetic spirituality and missionary spirit. Tolotta was indeed a renowned preacher, whose oratorical ability and catechistic zeal attracted large popular audiences (*numerosissimo popolo*) to his sermons. He had a direct connection with the Hapsburgs and had been invited to celebrate a series of Lenten masses at the court in Vienna.[34] That the authors of the pieces in Gaetana's booklet were mostly well-known ecclesiastics—and the choice of Giuseppe Richino Malatesta, the Regio-Ducale printer, as printer—were clear signs that the entire publication enjoyed the favor of the imperial authorities and the Milanese Curia.

The Agnesi conversazione was an emblematic site for the elaboration of what I refer to as *Catholic Enlightenment*. A cautionary note should precede the use of this term as an analytic category. Scholars have labeled reform

movements within eighteenth-century Catholicism variously as *katholische Aufklärung, lumières catholiques,* and *cattolicesimo illuminato*. Not unlike *Enlightenment,* these terms have been used in a variety of different ways. Some scholars have highlighted the activity of enlightened Catholics in the early part of the century, while others have seen the movement flourish after 1770 and during the revolutionary years, identifying it essentially with the Jansenist movement. The geographical setting of Catholic Enlightenment has been equally varied. Most forms of the Catholic reformism that emerged during the century have been grouped under the same label, even though reforming Catholicism meant something different to a French Jansenist bishop, to a Hungarian Piarist teacher, and to an Italian Jacobin priest.

In this study, I am not particularly concerned with the correct definition of Catholic Enlightenment but rather with turning this term into a useful descriptive tool. I use it rather narrowly to refer to the project of reforming Catholicism and its relation to civil society as described by Lodovico Antonio Muratori (1672–1750) and some of his correspondents at the beginning of the eighteenth century. These Catholic literati perceived themselves as a "third party" between the conservative front and the varied world of Jansenism. Their movement played a significant role in the cultural and religious life of the Italian peninsula during the first half of the century, particularly in Piedmont, Lombardy, Emilia, the Venetian Republic, Tuscany, and Rome itself. Significant groups within the regular and secular clergy gathered around the main tenets of Muratorian religiosity, pressing for the reform of Catholic theology, liturgy, and education. In the years of its apogee (1740–50), the movement was actively backed by learned cardinals, literary periodicals such as *Novelle Letterarie* of Florence, and by the pontiff Benedict XIV, who considered Muratori "the light of Italian science."[35] The most representative texts of the movement circulated widely throughout Catholic lands and became important resources for those supporting religious and social reform from Portugal to Hungary.[36]

In his time, Muratori was known primarily as an erudite historian of the Church and of medieval Italy. The rigorous philological methodology and the historiographical vision that shaped his publication of medieval documents were inspired by the works of the Bollandists, the monks of Saint-Maur, and the imperial tradition of diplomatic and juridical historiography.[37] Throughout his work, Muratori addressed the issue of the boundaries between freedom of thought and religious dogma, maintaining that the crit-

ical spirit was not only compatible with religion but also actually necessary to its survival in the modern world. A "healthy critique" was "absolutely indispensable to the Church," as it could debunk superstitious and false beliefs that had suffocated the original Christian doctrine and attracted growing criticism. Scientific investigation was to be fostered by the Church, Muratori claimed, as "the search for truth is, in the end, a search for God."[38] Among Muratori's targets were not only the superstitious cult of relics but also aspects of the cults of the saints and of the Virgin Mary.[39] He shared with Benedict XIV both a skepticism about recent visions and revelations, such as those of the nuns Maria de Agreda (1602–65) and Maria Crescentia Höss (1682–1744), and hostility to explicitly antimodern devotions, such as that to the Sacred Heart of Jesus. Instead, Muratori defended what he called a "reasonable" Catholicism, characterized by a more sober devotional practice.

However, as it emerges clearly in his *De ingeniorum moderatione* (1714), Muratori exempted the knowledge of dogmatic theology from critical analysis. Published in Paris as a response to Jean Leclerc's attacks on Augustinian theology, this book outlined a radically dualistic ontology and epistemology constructed within the Cartesian tradition. The spiritualist assumption protected a core of essential dogmas but, at the same time, opened vast areas of knowledge to critical scrutiny. According to Muratori, the boundaries of dogmatic theology had been illegitimately broadened in the past, thus causing misleading criticism of scientific investigation, as was obvious in the condemnation of Copernicanism and the Galileo affair. Not surprisingly, it proved difficult for Muratori to publish this book and escape official condemnation.[40] In other publications, he argued for the creation of popular missions and new schools devoted to teaching the true Christian doctrine, for modernizing the education of the clergy, and for an intelligible liturgy in which Latin would be replaced by vernacular languages. These considerations were expanded into a new antibaroque esthetic promoting *buon gusto* "in the sciences and the arts" along lines similar to those we encounter in the works of his fellow-citizen and friend Tagliazucchi.[41]

A self-proclaimed admirer of Galileo and Newton, Muratori seemed to take for granted a mechanistic conception of nature. The philosophical background of his work remained essentially Cartesian, although his was a Cartesianism filtered through Nicolas Malebranche's apologetic interpretation. Overall, Muratori was rather suspicious of sensationalist doctrines, which he deemed rich in dangerous moral implications. This brought him

to write a treatise of moral philosophy "for the young" in which he criticized John Locke's utilitarianism and hedonism, contrasting it with the moral principles found in the New Testament gospels. Muratori had previously published a major work on the spiritual and temporal meaning of charity for the Catholic believer (*On Christian Charity,* 1723, translated into French in 1745), in which he elaborated on the Augustinian themes of charity as the supreme virtue and its identification with divine grace. This work effectively illustrated his pragmatic morals and their immediate social dimension.[42] Not that the connection could have escaped his contemporaries; in 1716 the prestigious historian, who had collaborated with hundreds of scholars throughout Europe, decided to become provost of one of the most deprived and ill-reputed parishes in Modena, his hometown. There he founded and for many years directed a Company of Charity, an institution for the moral and economic assistance of the lower classes, a small-scale version of his social vision of a just Catholic society.[43]

The summation of Muratori's social thought and the single piece of work that best illustrates the unitary nature of his reform project went to press in 1749, shortly before his death. In it, he introduced the phrase "public happiness" as something to be achieved by an enlightened government through the appropriate economic policy.[44] He listed, chapter by chapter, the concrete reforms that could enhance the welfare of the people. He rejected the belief that human sociability could be grounded on individual egoism and defended instead the regulative function of the virtues of justice and charity. Social links of solidarity and relationships of power were thus grounded on religion in a new and original way, abandoning the scholastic doctrine of human society as the immediate production of an innate *socialitas* and the early modern notion of prudence as the main political virtue of the Christian prince. This solution, which echoes a similar treatment of the social link in Malebranche, also reveals Muratori's familiarity with the debates on jusnaturalism in German-speaking areas and the work of Leibniz, with whom Muratori corresponded. Significantly, Muratori dedicated his treatise to Andreas Jakob von Dietrichstein, prince bishop of Salzsburg, a prince who was guiding political and religious reform in his lands under the banner of the motto *Amore et iustitia*—truly a living proof of the feasibility of the Muratorian project.[45]

Enlightened Catholics could thus look to Muratori to organize their varied theological and philosophical sources within a coherent and theologically sound reaction against the excesses of baroque devotion. Rather than

constituting a unitary movement, they shared a set of basic assumptions, inclinations, and ideals. On the one hand, they aimed to return to the simplicity and purity of an idealized primitive church; on the other, they argued for the renewal of the educational system, which included the introduction of modern authors to the philosophy and theology curricula and the abandonment of scholastic philosophy as the privileged instrument for understanding empirical reality. Reform should invest matters of theology, particularly moral doctrines, liturgy, devotion, culture, and education. The Jesuit institutions and doctrines were often singled out as polemical targets—from the curricula of their colleges to their relaxed moral doctrines. With regard to the latter, enlightened Catholics would often find themselves aligned with the positions of rigorists such as the Dominican Daniele Concina, a defender of probabiliorism against the perceived moral laxism of the Jesuit doctrines of Molinism and probabilism.

Because of their moral rigorism and antibaroque fervor, historians have at times confused enlightened Catholics with the supporters of Jansenism. This was a doctrine characterized by rigid morals and a pessimistic perspective on the human condition that emphasized the role of grace and devalued the function of good works and sacraments. It was repeatedly condemned by the popes, most famously in Clement XI's bull *Unigenitus dei Filius* (1713).[46] Enlightened Catholicism and Jansenism certainly shared many ideas within the tradition of Augustinian theology and the rationalist pedagogy of Port Royal. They also shared the concept of the primitive church as a model for religious renewal, as well as an emphasis on liturgical and educational reform. However, enlightened Catholics were careful to distinguish their efforts from those of the Jansenist heretics, ever mindful of the authority of the pope and scarcely interested in the jurisdictional battles of Gallicanism. They also showed little inclination to enter theological disputes unless these were related to concrete, practical issues. They tended to be skeptical about contemporary phenomena of religious enthusiasm and miracles, and the Jansenist defense of the Parisian convulsionary movement of the 1730s further deepened the gap between the two movements. They also parted company on significant themes such as the meaning and relevance of historical studies and the emerging capitalist economy. What was distinctive about the Catholic Enlightenment was its humanitarian Christianity, based on a fundamental theological optimism and the necessity to combine spiritual asceticism with charitable action, thus turning Christianity into a force of social transformation.[47]

By the time of Gaetana's early performances, enlightened Catholics were convinced that the perceived rampage of impiety and heresy could be fought only by combining the purest spirit of the primitive church with the acquisition of modern knowledge. Thus, in theology they would defend the patristic and scholastic tradition against the Jesuit innovations of the seventeenth century, while arguing for the complete dismissal of Aristotelian metaphysics in the study of natural philosophy. The reading of Aristotelian texts, still common in universities and Jesuit colleges, should, they said, be replaced by the doctrines of Descartes, Malebranche, Newton, and the Dutch experimentalists. Enlightened Catholics also believed that religion was not an obstacle to but rather the means of transforming society, and that this transformation should necessarily pass through a critique of the traditional ways in which knowledge was produced and legitimated. Focusing on Gaetana's education enables us to explore the making of the culture of the Catholic Enlightenment and bring to the surface the new links that were being forged between specific devotional practices and their privileged social referents, and the way in which the latter constructed their social identities.

CHAPTER THREE

Trees of Knowledge

The large room in which Gaetana studied and wrote was far from the site of the conversazione and sheltered by a series of quiet rooms that were used by members of the family for prayer and rest. In one of these rooms, facing an ivory crucifix, was a walnut prie-dieu. Next to it, a door opened onto Gaetana's studio, a room notable for its sparse decoration and lack of precious textiles. The visitor's attention was instead captured by four large globes, three armillary spheres, and "various instruments [*ordigni*] for the study of mathematics," which were on display in a window case and on a desk. Another desk held piles of books and maps. Gaetana used two small Chinese-style tables and a few padded chairs for conversation with family members and tutors. Against the wall was her growing library, the higher shelves accessible only by means of a ladder.[1]

Gaetana grew used to reading and working independently early on, as her tutors had teaching and pastoral duties that kept them out of the city for long periods. When they did meet with their young pupil, they would discuss topics that she found particularly problematic and the structure of her study plan. Gradually this teaching method evolved into a rich scientific correspondence. From time to time, Gaetana was also invited by her tutors to contact specialists who could answer her queries more appropriately, particularly as she began to study the physical and mathematical sciences. By the mid-1740s, she had built a network of correspondents that included former tutors as well as numerous literati, philosophers, and mathematicians active in other Italian cities.

Gaetana was tutored by Belloni and Manara in pure and mixed mathematics, and by Michele Casati (1699–1782) in metaphysics and moral philosophy. Casati was a Theatine priest from the church of San Antonio, an ascetic figure known for his rigorous morals. In moral theology, he favored

the Augustinian tradition, which is why a number of ecclesiastic historians have described him as a Jansenist. Gaetana's surviving papers contain part of their correspondence and also manuscript materials that Casati gave her to supplement his lectures. Judging from the letters, Gaetana was on remarkably familiar terms with the Theatine priest. Not only would they discuss family issues such as Pietro's health and his second wife's character, but she would share with him her ironical remarks about the functioning of the conversazione and her own public performances. Most of their surviving letters date from around 1739, when Casati left Milan for Turin.

Casati was then in his thirties and well on his way to a successful ecclesiastic career. A brilliant student, at the end of his course he had been "invested by the holy fervor" and a longing to devote himself to preaching. However, his superiors thought otherwise and decided to employ him as a teacher of philosophy and theology for novices and a spiritual assistant to a lay religious congregation of merchants hosted at the Theatine house of San Antonio. During his years at the Milanese Theatine house, Casati also gave private tuition in geometry, natural philosophy, and Greek. He was well versed in the subtleties of moral philosophy, and on Muratori's advice, he was called by the king of Piedmont to occupy the first chair in this discipline to be established at the Royal University of Turin. Casati acted for years as royal adviser on liturgical and pedagogical reforms and, in return for his services, was eventually made bishop of Mondovì (1753).

That diocese thus became the laboratory for Casati's catechistic and social experiments, which were clearly informed by the spirit of Muratorian reformism. Casati redesigned the curriculum of the seminars, created new libraries, and founded an institute of education for orphans. His friend Giovanni Battista Beccaria, one of the Italian pioneers in the study of electricity, wrote that Casati had freed the city of Mondovì from prejudice, fought ignorance like no other, and favored the creation of a truly "enlightened clergy" (*clero illuminato*). The literary career of Pier Domenico Soresi, the son of a Piedmontese bricklayer, was an exemplary product of Casati's reformist action. Casati encouraged the boy to pursue his studies beyond the elementary level, and after ordaining him a priest, he sent him to Milan to further his education. Soresi became a well-known author of pedagogical essays aimed at showing the possibility and social utility—the "necessity," in fact—of educating both women and the poor.[2]

Casati went down in ecclesiastic history primarily for his zeal in pastoral and catechistic activity, which culminated in the publication in 1765 of what

proved to be one of the most influential catechisms of the Catholic Church. Its writing was clear and direct, very much like his preaching style, and in northern Italy, the book largely replaced Bellarmino's texts. Casati aimed to offer to his readers the pure doctrine of the Gospels, freed of all human opinion and in a form "that was suited to the child's mind"; he even produced three different versions of the catechism to suit children at what he believed were the three different stages of their intellectual development. His later sermons and pastoral letters were also memorable, shaped as they were by both reformist aspirations and a rigorist zeal that caused him to chastise theater spectacles and "the revolting habit of men dressing the hair of women."[3]

Casati contributed substantially to Gaetana's course of philosophy. This began with a short essay on ethics to guide her in her exploration of human knowledge. The text answers the question, What is the goal of human life and the source of natural happiness? It contains a teleological description of the universe, the complexity and variety of which, Casati remarks, could only have originated from "a single and wisest cause," not by "mere chance." A clear demarcation is established between the different levels of reality—from brute matter to animal life and then to the human soul, which he defines as a spiritual substance *cognitionis capace*. Human appetites are classified and ordered correspondingly. While apparently chastising ancient Epicurean philosophers, Casati aimed his antimaterialist and antihedonist arguments at closer enemies. His was indeed a response to what was perceived by the Catholic intelligentsia as a wave of attacks against the dichotomy of spirit and matter and their possible materialist implications. This historic-critical essay ends by demonstrating that the highest possible achievement of human intellect, and the source of perfect natural happiness, consists of the intellectual knowledge of God. Casati thus suggested to Gaetana that she follow Augustine in this field, identifying the *summum bonum* with the contemplation of the eternal truths. However, human beings are unable to contemplate the image of God in all its clarity because their minds are necessarily affected by the corporeal dimension. Hence the need to train the intellect and refine its capacity of attention as much as possible; indeed, this should become an essential aspect of Christian education.[4]

Casati's notes on ethics did not enter the more rarefied terrain of supernatural beatitude, probably because they were intended primarily as a complement to Gaetana's study of natural philosophy. In fact, they were the em-

bryo of a more articulated and substantial treatise, *Institutiones philosophiae moralis*. This tract, probably completed around 1740, remained in manuscript and was believed lost after Casati's death, but today it can be read in the National Library of Turin, 176 folios heavily written on both sides, containing a punctilious classification and definition of virtues. Although not particularly original in its content, this text provides us with useful indications about the anthropological and epistemological assumptions of an enlightened Catholic like Casati and his assessment of the status of the modern sciences. Essentially there are two definitions of the act of cognition, depending on whether it is performed in conjunction with the senses (*conjuncta cum sensatione*) or not. In the first case, external objects are variously represented to the mind by means of imagination or fantasy, and the resulting knowledge has a material component that cannot be eliminated. In the latter case, cognition is an act of pure intellection (*pura intellectio*), and this is the privileged status of the knowledge of mathematics and metaphysics. Such scholastic-flavored passages are integrated into the discussion of modern authors, particularly Descartes, whose theory of passions is carefully presented and weighed. In addition, there is a discussion on the virtue of being studious (*de studiositate*). This virtue, the opposite of mental idleness, can dispel the torpor of the intellect (*torpor ingenii*) and should be nurtured by teachers with particular vigor.[5]

Augustinian spirituality and Thomistic philosophy were important sources of inspiration for the enlightened Catholics around the young Gaetana. Pietro Verri (1728–97), a patrician who became a protagonist of the Milanese Enlightenment in the 1760s, referred to the philosophical culture of Gaetana's youth as "a motley of Aristotelian opinions and Cartesian imagination."[6] There is some truth in this scornful definition; the basic scholastic framework of Gaetana's curriculum did not prevent tutors such as Casati, Manara, Stampa, and Belloni from integrating materials from Descartes and Malebranche into their teaching, as well as those from the Dutch and British empiricist traditions. Indeed, Gaetana was able to read and discuss modern authors more freely than she would have done in a college of education.

Her philosophical studies followed the basic structure of the university textbook published by the theologian and philosopher Edmond Pourchot (1651–1734). First published in 1695, this textbook circulated in numerous and affordable editions during the first decades of the century. The now-for-

gotten Pourchot was once judged "one of the most celebrated professors of philosophy who ever taught at the University of Paris," and he was nominated to be its rector seven times.[7] Designed for the university's philosophy course, the textbook was soon used in colleges as well. In the name of Galileo, who had freed philosophy from "the yoke of inveterate custom," Pourchot offered a course that ignored vain speculations and focused instead on "useful philosophy"—useful, that is, for augmenting the readers' natural knowledge of God and hence their Christian virtues.[8]

Pourchot's logical and ontological conceptual apparatus is essentially scholastic, but when it comes to epistemology and natural philosophy, he introduces many of the doctrines of his favorite contemporary authors, Descartes, Gassendi, and Malebranche. The content is ordered in a rather traditional way: logic, metaphysics, geometry, *physica generalis, physica specialis,* and ethics. Logic, the art of thinking correctly, opens the course for didactic reasons, even though it is ontologically dependent on the truths of metaphysics. Metaphysics is divided into ontology and pneumatology—the science of God and the science of the spiritual entities, respectively. It is presented as the supreme form of human knowledge and the one in which the human intellect can attain the highest level of certainty. The ontological and epistemological hierarchies that Pourchot establishes at the beginning of his course value, above all, the level of certainty that could be attained by a science (that is, moral, physical, or metaphysical certainty), and the speculative rather than the practical nature of sciences such as metaphysics or mathematics, whose goal lay in contemplation rather than action. According to this value scale, the science of geometry, the two branches of physics, and the science of ethics follow in descending order from metaphysics. Pourchot insists on the affinity of geometrical and metaphysical truths, both accessible through acts of pure intellection. The brief geometry section is limited to a series of definitions and some basic Euclidean theorems. However, this was the first time that the treatment of geometry preceded that of physics in a French university course, a clear homage to the mathematized natural philosophy of the moderns.[9]

The course is grounded in the distinction between acts of pure intellection—which includes as its highest achievement the contemplation of the divinity—and operations of the imagination (*imaginatio*), in which the acquisition of knowledge is necessarily mediated by the action of corporeal phantasms and animal spirits. In both cases, the human mind has no power in itself and can acquire knowledge only through a continuous divine illu-

mination (*mentem nostra non esse sibi suum lumen, sed a Deo illuminari*). In other words, human cognition is by definition a passive process: the mind can construct (*fabricare*) its ideas neither through the intellect nor the imagination. In scholastic terms, humans are not provided with an *intellectus agens*.

A last point worth mentioning is Pourchot's use of Christian anthropology when defining the relationship between intellect and will. The proper performance of the act of cognition required a specific interaction between these two basic faculties of the human mind: the act of intellection has to be preceded by the will so that the act can be performed accurately. This deliberation is called "attention" (*attentio*), a key term borrowed from Malebranchian philosophy and one that we have already found in Tagliazucchi's and Casati's work. Attention is a prerequisite of philosophical knowledge and, at the same time, a form of "natural prayer." Therefore this concept carried both a cognitive and a religious meaning. Through its use, the cognitive pursuit of the Christian scholar could be invested with an immediate spiritual significance.[10]

What Gaetana did with Pourchot's systematic course illustrates nicely the making of an enlightened Catholic vision of knowledge. She skipped the long sections on syllogistic logic altogether, opening her notes with a short metaphysical section. This contains some remarks on Descartes's theory of the mind as thinking substance (*substantia cogitans*) and on Malebranche's doctrine of ideas and the vision in God, which underlines the passivity of human cognition as well as the religious significance of the acquisition of knowledge. Occasionally, Gaetana lifts a passage from Pourchot, but mostly she notes in the margin the page numbers she is indirectly referring to. Gaetana's handwriting is sometimes replaced by Casati's or some other tutor's, which indicates that she was working with a variety of heterogeneous materials. Her text, like Pourchot's, is in the form of a university lecture: a statement is made, a series of corollaries are derived from it, then possible objections to any of these are raised and weighed. Some matters remain undecided while others can be reasonably settled. This discursive and literary technique offered itself to numerous variations and additions and thus suited Gaetana's irregular communication with her tutors well.

The notes on metaphysics are concise, ignoring completely Pourchot's long sections on the attributes of God and the angels. The sections on logic, ontology, and pneumatology have been transformed into a preliminary dis-

course on the psychological and epistemological conditions for the acquisition of knowledge, wherein the use of Aristotelian metaphysics is limited to the properties and relations of mental images rather than real entities. This metamorphosis of the scholastic tree of knowledge was typical of the textbooks of natural philosophy written by enlightened Catholics. Some Jesuit mathematicians and experimental philosophers also modified the traditional curriculum along similar lines, even though the theologians within their own congregation would generally oppose any such disempowerment of the Aristotelian metaphysics. Roger Boscovich's texts on natural philosophy illustrate the extreme sophistication that this strategy would reach within the Society of Jesus on the eve of its dissolution.[11]

Gaetana skipped the brief section that Pourchot devoted to Euclidean geometry and moved straight onto *physica generalis*—that is, the science of the general properties of created entities. The issues of time, motion, and infinite divisibility are covered with some care, and at this stage references to and quotes from authors that did not figure in Pourchot's course, such as John Keill and Isaac Newton, begin to appear. Newton is credited with the discovery of the "true doctrine of gravity" when he stated that the real cause for this phenomenon is the continuous action of God in the universe. Pourchot, for his part, defended the Cartesian explanation of gravity, based on the theory of vortexes. Similarly, when dealing with the nature of light and colors, Gaetana appears to have found Pourchot's Cartesian doctrines less probable than the Newtonian ones. In particular, she considers the 1720s controversy between Newton and Giovanni Rizzetti, and Rizzetti's experiments are described in some detail.[12]

Most of Gaetana's course is devoted to *physica specialis,* the science of the contingent properties of created entities, which included a variety of topics in natural philosophy. This section includes the formation of the Earth, its main features, and the properties of minerals and metals. Pourchot's Cartesian doctrines are replaced by Newtonian ones, as in the case of magnetic phenomena. The description of the vegetal realm follows, with various propositions on the structure and physiology of plants.

The section on animals contains references to the important debate about whether animals had souls and, if so, what kinds of souls those would be. Descartes had famously denied that the brutes could possess souls and equated their form of life to the functioning of mechanical automata that could neither feel nor know. Although favoring a radical dualism between spirit and matter, Gaetana and her teachers seemed concerned about equat-

ing animals to automata. They maintained that animals were endowed with both sensibility and some basic form of cognitive faculty. However, attributing such a faculty to animals could mean either that they have a spiritual soul or that brute matter possesses remarkable self-organizing properties, both options running counter to traditional Christian anthropology and carrying possibly dangerous consequences for the integrity of religious dogma. Gaetana's notes show awareness of the delicacy of the problem and indicate a possible way out. Animals are not "artificial machines" destitute of sense and cognition, Gaetana reasoned, but they do not seem to be endowed with the superior faculties of will and intellect, which are exclusive attributes of the spiritual soul. Hence the most likely hypothesis is that they are animated by an "animal soul," which makes sensory perception possible and controls acts of volition relative to material objects. Whether the animal soul is material or immaterial was open to debate, but its supporters agreed that it was not infused by divine action like the spiritual soul and that it eventually died with the body. In the human being, this inferior soul coexisted with the spiritual soul, and the two would indeed determine the two basic inclinations of the human mind: one toward spiritual, universal, and eternal objects, including God himself; the other toward corporeal, sensible objects and their material fruition.[13]

Although the doctrine of the two souls was rejected by orthodox Cartesians, its promoters saw it as a natural development of Malebranche's dualistic theory of cognition. Unlike Descartes, the Oratorian priest and his followers understood the acts of intellectual perception and those of physical sensation as two heterogeneous and independent processes.[14] This meant that some form of cognition could be attributed to animals without granting them any superior intellectual faculty. This dualistic epistemology and the theory of the two souls must certainly have looked plausible to someone like Gaetana, who had grown up immersed in the intense practice of Theatine spirituality. As we have seen, her spiritual exercises were based precisely on the perception of an inner struggle between "two wills," the two contrasting inclinations of the human mind. Believers who constantly practiced such mental exercises would indeed gradually perceive their entire life to be built around this struggle. Not only would they construct all their desires and emotions around this inner combat, but they would also perceive the gradual strengthening of their control over their material, animal component through the practice of appropriate meditation techniques. These considerations might help to explain why Malebranche's theory of knowl-

edge enjoyed such widespread success among enlightened Catholics, even though Malebranche himself had remained faithful to Descartes on the question of the animal soul. Essentially, Malebranche's doctrines were used by enlightened Catholics as a way of integrating their Platonic-Augustinian approach to intellectual knowledge with the practice of experimental philosophy, and their ascetic spirituality and rigorous morals with a philosophically viable theory of the mind.

Gaetana's notes continue with sections on animal and human reproduction, in which she summarizes the discoveries of Marcello Malpighi (1628–84), Antony van Leeuwenhoek (1632–1723), and Antonio Vallisneri (1661–1730) and, against the opinion of some Catholic authors, shows them to be consistent with the scriptures. She then devotes a particularly long section to the functioning of the human machine. The various organs should be described "not based on the principle of mechanics but on actual experiments and observations." The ensuing pages contain descriptions of the processes of respiration and nutrition and of the structure and functioning of the organs, most notably the heart, circulatory system, and muscles, and the physical structure of the organs of perception and their connection to the brain via the nerves, which serve as channels for the movement of the animal spirits. Gaetana then discusses the fine structure of the brain in some detail, recognizing this organ as the proper site of perception and of the spiritual soul. The brain is indeed the material support where images were stored for subsequent intellectual operations.[15]

In Pourchot, the contemplation of the human machine, rich as it was in teleological suggestions, concluded the teaching of natural philosophy and opened the way to the treatment of ethics. Not so in Gaetana's notes, where various other phenomena are considered, particularly the aurora borealis, the origins of fossils, and the functioning of vision. An essay on vision (*De visu, dissertatio physico-optica*) is rich in figures and diagrams, containing a description of the properties of light and the functioning of the eye as a camera obscura, an explanation for numerous optical illusions, and instructions for the construction and use of optical instruments such as lenses, microscopes, and telescopes.[16]

At this point, with a rather unpredictable turn, Gaetana's attention shifts to a detailed description of the properties of gunpowder, the functioning of guns, and various ballistic experiments, some of which had first been performed by the French engineer Bernard Forest de Belidor in 1729. This peculiar way of introducing the student to mixed mathematics was common

during that period and even more so in places like the state of Milan, a true battleground of European powers. Just consider that, in the 1730s, the years of Gaetana's youth, Milan was besieged and militarily occupied twice. For many young cadets, a military career in the imperial army was the only real alternative to entering the Church, and with the lack of military academies, religious colleges and private tutors provided them with the necessary technical knowledge. The teaching of mixed mathematics at the Jesuit college of Brera was no different in this respect, and Gaetana's tutors found it easier to approach the discipline through such a familiar and well-tested selection of topics. In fact, there is evidence that Gaetana was studying ballistics as early as 1733. In that year, Manara wrote to her from Rome, congratulating her on her recent progress in her studies and providing the solutions for certain ballistic problems that she had found difficult. The letter is also interesting because it reveals that Pietro himself had contacted Manara to raise the issue, which shows the extreme importance he placed on Gaetana's educational progress.[17]

Similarly updated and missing from Pourchot was the section on the much-debated problem of the shape of the Earth. Gaetana reports some of the experiments of Clairaut, Mapertuis, and Celsius and summarizes their controversy with Cassini and Picard. She accepted the opinion that the Earth was a spheroid with flattening at the poles as the more reasonable. However, the controversy was still very much open, and Gaetana twice changed her opinion within the next couple of years, thus already revealing a marked independence of thought at this stage of her studies.[18]

The remaining manuscripts deal with topics from various branches of mixed mathematics, most notably mechanics and hydraulics, the latter being particularly useful in the states of the Po Valley, an intensely cultivated region that depended on a sophisticated network of canals. There is an introductory treatise (*Physices principia mat[h]ematica introductio*), in which various references are made to Newton's *Principia mathematica*. The main text is integrated with folios containing geometrical demonstrations and problem resolutions—clearly Gaetana's exercises and some of the responses of her tutors. There are also instructions for the use of globes, followed by trigonometric problems, instructions for the construction of solar clocks, a dissertation on gravity that focuses on the relationship between God and the machine that is the universe, and some brief notes on the controversy over the live forces, with a punctual summary of the debate and a cautious assessment of the positions of Italy-based contributors such as

Jakob Hermann, Giovanni Poleni, Giovanni Crivelli, and Guido Grandi. Gaetana's notes on natural philosophy conclude with a treatise on the "systems of the worlds." The section on the misunderstandings that led to Galileo's trial is noteworthy. The principles of cosmography, she argued, are not a question of dogma, and those who referred to the scriptures to defend one system against another were gravely mistaken.[19]

At this stage, one comes across the only notes devoted to pure mathematics that were part of this course: an introductory dissertation on the nature of geometry and the theory of proportions, which is not too different from Pourchot's section on geometry. Geometrical entities are introduced as abstractions of the mind. They are real but do not have any existence if they are not within physical bodies. Skeptical conclusions about the certainty of mathematics and the most famed geometrical paradoxes, Gaetana wrote, originated precisely in the misunderstanding of the nature of geometrical knowledge. A consequence of this traditional view of geometry is that the activity of the geometer is portrayed as an act of contemplation. Geometrical reasoning, in other words, relies on the functioning of the intellect in its purest form. Nothing apart from metaphysical contemplation can be paired with it.[20]

In parallel with her main philosophy course, Gaetana was deepening her knowledge of pure and mixed mathematics with the assistance of Manara and Belloni. Traces of this training can be found throughout her manuscripts, mostly in reading notes, problem solutions, and short dissertations in different people's handwriting, collected through her correspondence network. For the most part, these materials are related to Guillame de l'Hospital's treatise on analytic geometry (1707), which Gaetana was already reading in July 1735. At that time, Belloni sent her his solution to a certain equation that she had found difficult to tackle. He admitted that his own solution was not particularly straightforward and was possibly too long to be useful to her. Useful for what? It emerges that Gaetana was planning to write an introduction to l'Hospital's tract, to make it more accessible to the young student. Most of the manuscripts and books she collected during the following five years can be directly related to this project. Although helpful, Belloni seemed to be less than enthusiastic about this particular strand of Gaetana's study. "If the Marquis de l'Hospital took pleasure in these kinds of computations" he wrote to her, "I am not surprised at all that he died young." Indeed, the Pavese nobleman tried, although very cautiously,

to dissuade Gaetana from this task. He obviously did not succeed and their discussions on l'Hospital and Newton's *Principia* continued via letters, conversations at Pietro's house, and even in the streets of the Pantano quarter, on their way home after attending the sermon in the church of San Antonio.[21]

Gaetana could also rely on the advice of other scholars, mostly professors who had frequented the Agnesi conversazione and had remained in contact with her. Some members of the conversazione were also able to mobilize scholars within their religious order to assist Gaetana. In this respect, the Benedictine network of which Brancone and Stampa were part seems to have been particularly efficient. In November 1738, for example, Brancone passed on to Gaetana two letters from university lecturers at Bologna and Naples, both Celestine monks, who had agreed to answer her questions on certain passages of l'Hospital. If she desired, Brancone added, he could make similar requests to other university lecturers of his order. Meanwhile he sent his greetings to "Don Pietro" and "to the entire conversazione."[22]

Gaetana's early education and philosophy studies followed a course comparable to that of a Jesuit college of education rather than to the more practical training offered to commoners in the Piarist or Somaschan public schools. However, the form and content of her curriculum were significantly different from the Jesuit model, and the didactic priorities were often reversed, as in the case of the educational role of Italian and Latin. There is evidence that some Jesuit colleges based their philosophy course on Pourchot's textbook. Unlike Gaetana, though, college and university students focused on the early sections: logic, metaphysics, and general physics. The lecturer would beef up that structure, dictating a large amount of material from the Aristotelian corpus, essentially the only source that the pupils would read extensively. In fact, the three philosophy classes at Jesuit colleges reflected the structure along which the Aristotelian corpus had traditionally been divided in medieval times, mostly through the Thomistic mediation and the sixteenth-century authors of didactic compendia.[23]

In these years, Gaetana also refined such highly valued skills as her fluent Ciceronian style, her oratorical ability, and her capacity to engage in formal academic disputations. Like college and university students, Gaetana was trained to defend in public the knowledge she had acquired. The structure of the academic disputation was fixed: the teacher would ask a question and the student would provide an answer and derive various conclusions. At that

point, a number of possible objections would be raised by an opponent, normally the teacher himself, and the student would have to find the best way to refute them.

Pourchet's textbook contains a list of important topics (*quaestiones*) and some paradigmatic disputations. The topics are exclusively metaphysical, the language necessarily abstract and rich in technical terms from the late scholastic tradition. At the end, Pourchot also offers a list of possible ready-made propositions to be defended by students in their final theses. These take the form of paragraphs of ten to fifteen lines, and their topics reflect the content of the course, including some from logic, metaphysics, ethics, and physics. A small minority of the theses deal with the nature of matter, motion, cosmological hypotheses, the question of the animal soul, and some experimental matters such as the generation of animals and the circulation of blood. Pourchot's selection thus illustrates clearly the primacy of metaphysics and the marginal role played by experimental disciplines within his philosophical course.[24]

In Gaetana's preparatory notes for her public disputations, this balance is reversed. She wrote down a series of numbered questions and then her answers, in the first person singular. A few, taken from Pourchot, dealt with formal and definitional topics of metaphysical relevance, such as the relationship between universal concepts and singular instances, or the essence of the human mind. She also treated epistemologically relevant questions such as the origin of the idea of God and Malebranche's doctrine of the vision in God. She had filled some twenty-five folios by this point; the next hundred and fifty contained only questions on natural philosophy. These ranged from the popular topics on the nature of light and colors—where reference is made to Malebranche, Newton, and Rizzetti—the origin of spring waters, the theory of tides and the effects of lunar attraction, the nature of various meteorological phenomena—which includes the Newtonian explanation for the rainbow—the circulation of blood, and the shape of the Earth. There is no evidence that Gaetana ever disputed on traditional metaphysical questions such as those suggested by Pourchot. Metaphysical topics were scarcely explored in her course, and neither were problematic issues in dogmatic theology.

This approach certainly reflected the tenets of the enlightened Catholic cultural reform and the intention to promote the teaching of the modern natural and mathematical sciences. It also helped train Gaetana to perform at her best in the context of a genteel conversazione. This was hardly per-

ceived as a proper site for disputations about the attributes of God and the angels, which should rather be performed within the aptly policed spaces of religious colleges and university halls. Moreover, the dogmatic nature of the truths involved made metaphysical questions scarcely suitable for a lively discussion. On the contrary, questions in natural philosophy such as those discussed by Gaetana with Belloni, Brancone, Stampa, and others were well suited to be presented and consumed within a conversazione. The hypothetical nature of such statements and their inferior epistemological status made them metaphysically safe, while the open-ended and often spectacular character of certain controversies, such as the one about the nature of light and colors, could turn these topics into enjoyable cultural products.[25]

The Agnesi conversazione, with its public spectacles and publications, was emblematic of the new uses to which philosophical knowledge was being put outside the places where it had customarily been produced and consumed. The enormous success of Francesco Algarotti's *Newtonianism for Ladies* (1737) gives an indication of the scale of the phenomenon. However, there were important differences between the uses of science, and Newtonianism in particular, in Algarotti and in the Agnesi conversazione. As I have tried to demonstrate elsewhere, despite its light and mundane tone Algarotti's popularization of Newtonian experimental philosophy lent itself to a radical political reading. Although this might have escaped later historians, it did not escape the Holy Office, which made Algarotti's the only popularization of Newtonianism to end up in the *Index librorum prohibitorum* (1739). To Algarotti, Newtonianism was certainly a way to promote his experimental skills and his freelance career as a cosmopolitan man of letters; but it was also a means of illustrating to his public the marvels of the British political and economic system and of announcing the forthcoming regeneration of continental culture along the same lines. Algarotti used Newtonian experimentalism and Lockean epistemology both to promote a sensationalist image of knowledge in which there was no space for traditional metaphysics and to criticize the role of institutional churches in the cultural life of continental Europe. His Newtonianism was impregnated with motifs from seventeenth-century libertine culture, particularly the atomist and materialist currents of Tuscan libertinism. To this critical but elitist strand, Algarotti added an explicitly political dimension, largely inspired by the egalitarian ideals of contemporary Freemasonic discourse.[26]

Clearly, this was not the Newtonian culture promoted by enlightened

Catholics such as those who gathered at the Agnesi conversazione. It might be significant that, despite being on friendly terms with Belloni, Algarotti was never invited to the Palazzo Agnesi. Its regular guests envisioned the overcoming of traditional political and cultural forms—those of the society of the orders and scholastic culture—through the enlightening function of true Christianity rather than by a radical critique and rejection of them. We might say that enlightened Catholics were trimming the tree of knowledge differently from radicals such as Algarotti and that they supported an alternative image of human reason and its functioning.[27]

This image emerged clearly in those programmatic writings that Muratori devoted to the harmony of faith and reason, such as *De ingeniorum moderatione in religionis negotio* (1714) and *Delle forze dell'intendimento umano* (1745). Muratori fought on two fronts. On the one hand, he battled against "atheists and deists," among whom he singled out Spinoza, Hobbes, Toland, Bayle, Collins, Tyndall, and the Tuscan materialist circles. He related their work to the individualistic "rebellion" of the Reformation and to the secretive activities of the Freemasons, two motifs that would become popular in later counter-revolutionary culture. By undermining such basic dogmas as the existence of God or the immortality of the soul, these authors polluted the source of all moral values, thus weakening dangerously the "strongest links of human society." On the other hand, Muratori also fought the radical skepticism of conservative prelates such as Pierre Daniel Huet, who revived Pyrrhonist arguments to make a case for the weakness of human reason and the impossibility of knowing anything with certainty. Against this view, Muratori aimed to defend the "dignity of human reason," insisting on the reliability of the sensorial apparatus and the faculty of reasoning, defined as the capacity to operate deductions and abstractions over ideas.[28]

Muratori staunchly defended Galileo's distinction between theological dogma and empirical knowledge. Through this dichotomy he could shield dogma from critical analysis while fully legitimating the use of experimental methodologies and the rejection of late scholastic categories in the investigation of natural phenomena. Scholastic metaphysics maintained its relevance in theological matters, but it was also subject to a revision that aimed to eliminate all modern distortions, as emerged from Muratori's defense of the Augustinian theological tradition in *De ingeniorum*. Most distinguishing features of the scientific culture of Catholic Enlightenment derived precisely from this fundamental cognitive dualism. Emblematic of

this culture were Antonio Vallisneri's experimental approach to matters traditionally explained by means of biblical references, such as the origins of fossils or the age of the Earth, or his bold position on the issue of human and animal generation; Jacopo Riccati's early reception of and original contribution to the elaboration of infinitesimal calculus as the privileged instrument for the mathematization of empirical reality; and Giovanni Poleni's highly mathematized experimental philosophy. These and many other lesser-known devout Catholic philosophers shared a strong dislike for metaphysical disputes and for all-pervasive philosophical systems. Many of them were also skeptical about the appropriateness of teleological arguments and of natural theology *tout court*. This explains why their reception of both Newton and Leibniz was highly selective and mostly limited to the mathematical-descriptive aspects of their arguments.

The reluctance to freight the investigation of nature with an immediate metaphysical significance through some form of natural theology distinguished the enlightened Catholics of northern Italy from other groups of devout natural philosophers engaged in the modernization of Catholic culture. These included Celestino Galiani's Rome-based circle, which aimed for cultural reform that joined natural theology and Newtonian experimental philosophy and which enjoyed the patronage of powerful cardinals and some within the Roman Curia. The members of this group had, since about 1690, shown interest in the works of Boyle and Newton. Their attempts to replicate Newton's optical experiments had begun in Rome as early as 1706, with Galiani passing light rays through prisms with a copy of the *Opticks* as his only guide. Five years later, the astronomer and erudite historian Francesco Bianchini was in London to carry out a delicate cultural and political mission on behalf of the Holy See, which included meeting Newton and other fellows of the Royal Society. The following years saw the publication of numerous Italian translations of texts within the tradition of Newtonian physico-theology, particularly in Rome and Naples. An edition of the *Philosophical Transactions* also appeared in Naples (1729–34), translated into Italian by Thomas Dereham. This and other similar enterprises were supported by Roman prelates keen on promoting an apologetic Newtonianism in the style of the Boyle lectures as the new hegemonic scientific ideology in Catholic Europe. While this cultural program certainly facilitated the circulation of Newtonian texts in Italy—many of which were in Gaetana's library—it had less success in controlling how they were received.

Around mid-century then, being a fervent Newtonian was hardly a uni-

vocal attribution in the Italian context—rather like being a follower of Galileo. Moreover, the connection between these diverse Newtonianisms and the established Galilean schools of the peninsula was far from obvious. Thus, for example, while the Newtonian ideology found its most enthusiastic supporters in Rome and was closely associated with the cultural hegemony of the Roman Curia, it was resisted or selectively received in institutions where the Galilean experimental tradition was liveliest, such as the University of Pisa, or where the practice and application of calculus in its Leibnizian form was more up to date, such as at the University of Padua and on the Venetian mainland. Conversely, there is no evidence that Rome-based supporters of the Newtonian ideology such as Galiani had a full grasp of the mathematical techniques of the *Principia*.[29]

The study of Gaetana's manuscripts provides us with a rare insight into the reception and use of Newtonianism in Catholic enlightened culture. Elements from the natural theology and apologetic Newtonianism of the Roman groups are initially present, but Gaetana's interest soon shifted from natural philosophy to pure mathematics—a move emblematic of the mathematizing and technical approach of enlightened Catholics in northern Italy.

Unlike in Tuscany, the Veneto, or Bologna, the Catholic Enlightenment emerged in Milan as a movement made up pre-eminently by ecclesiastics. It is important to remember that, in this period, the Jesuit *ratio studiorum* was still dominant in Lombard and Milanese institutions of higher education. In Lombardy, there was no local Galilean tradition or local academy of sciences that would challenge the *ratio*'s legitimacy. Notable philosophers and mathematicians worked within the Lombard Jesuit framework until mid-century, including Girolamo Saccheri (1667–1733), professor at the University of Pavia and celebrated pioneer of non-Euclidean geometry. However, from the chairs of mathematics at Pavia and Brera and in the monastic schools, the only mathematics taught were Euclid and the theory of proportions.

The early supporters of Newtonian experimental philosophy were not in the Jesuit colleges and universities, but in conversazioni such as the Agnesi's, in private academies, and in some religious schools. Manara and Belloni stand out in the Lombard cultural landscape as the staunchest defenders of experimental methods in physics, while Gaetana would be the first to master differential and integral techniques and to promote their teaching.

Prior to Gaetana's own study of it, no one in Milan, or even in the whole of Lombardy, seemed interested in mastering the techniques of calculus. Yet, from what we have seen of her philosophy course, Newton's works and those of some British Newtonians were well known, and the study of the new philosophies was not subject to any particular censorship—quite the contrary, in fact. After all, it had been Milan, of all north Italian cities, that provided Algarotti with the conditions for the semiclandestine printing of his radical book in 1737.[30]

The paladins of the Catholic Enlightenment in Milan were to be found primarily among congregations and orders that either ran schools and colleges in competition with Jesuit institutions, such as the Barnabites, the Somaschans, and the Piarists, or had established traditions of philosophical teaching for their novices, as did the Theatines and Benedictines. Following Muratorian guidelines, these ecclesiastic teachers were trying to come up with a response to the religious, cultural, and social challenges of the century while remaining firmly rooted in the traditional Catholic world view. Most of them were actively engaged in revising their curricula and catering to new social groups.

During the first half of the eighteenth century, congregations such as the Piarists and the Somaschans, originally devoted to alphabetization, catechism, and elementary teaching, were reinforcing their position in higher education in direct competition with the Jesuit colleges. In fact, the Piarists (Clerici regolari poveri della Madre di Dio delle Scuole Pie) had a long tradition of scientific teaching and had been critical of the Jesuit curriculum since Galileo's time. They focused on teaching practical arithmetic and mixed mathematics to the trading and artisan groups. In the seventeenth and eighteenth centuries, a number of *scuole pie* had been created in Italy, Spain, and central and eastern Europe. Here children from all backgrounds were divided into classes and taught grammar and some commercial arithmetic (*abaco*), together with the catechism. All teaching was in the vernacular. The Piarists also entered the more controversial sector of higher education, founding colleges—the most prestigious being the Nazareno in Rome—and even schools of mathematics. At the time of Galileo's trial, a group of Piarist mathematicians supported his position in astronomy as well as his theory of matter, thus starting a long-lasting conflict with the Jesuits. As a consequence, the Piarists were nearly suppressed and lost much of their former prestige. It was only with the rise of enlightened Catholicism that Piarist schools fully regained their status. The pope granted Piarist

priests the right to teach theology and philosophy in their schools and to hold university chairs, as well. The Piarist *ratio studiorum* was reformed in 1718, and in 1748 their founder, José de Casalanz, was beatified—a clear sign of pontifical benevolence.[31]

During the same years, the Barnabites (Chierici regolari di San Paolo) were also at the apogee of their spread. They had found a convinced supporter in Benedict XIV, who charged them with running new nobiliary colleges and seminars.[32] From 1701, they were allowed to occupy university chairs, and in Milan they could also award degrees in theology (1749). The comparatively smaller Somaschan congregation (Chierici regolari Somaschi) had its *ratio studiorum* renewed in 1741, with the introduction of vernacular languages and contemporary authors in the mathematical and natural sciences.[33] Apart from the regular clerics, teachers from monastic orders such as the Benedictines were also renewing their curricula according to the tenets of the Catholic Enlightenment.[34] Even among the Theatines, who were not a teaching congregation, Cartesian and Newtonian elements had entered what at first appeared like a rigidly peripatetic curriculum, as leading Theatine teachers argued for the importance of the study of geometry and the new systems of the world, denying that it would be detrimental to theological orthodoxy.[35]

In 1742, Manara addressed the faculty and students at the University of Pavia in a speech that was a manifesto of the enlightened Catholic perspective on science. The occasion was his taking up the newly created position of chair of experimental physics. The establishing of this chair marked an important phase in the gradual erosion of the scholastic framework, as experimental physics was designed as a hybrid of particular physics and mixed mathematics and thus violated traditional metaphysical boundaries.

In his discourse, Manara criticized scholastic teaching, arguing that the science of nature is strictly limited to phenomena, as distinguished from essences, and that any a priori approach should be rejected in favor of a purely descriptive one, inspired by the Newtonian tradition and by the Dutch experimentalists Willem Jacob 's-Gravesande and Petrus van Musschenbroeck. At the same time, Manara insisted, the realm of metaphysical truths and religious dogmas would remain untouched by the new experimentalism. Limiting the mathematician's legitimate work to contemplation of the properties of abstract objects and introducing a cautious skepticism

and tolerant eclecticism to the study of empirical reality would prevent conflict between the truths discovered in the different spheres of being (metaphysical, mathematical, empirical). We can see how, in this perspective, a dated text like Pourchot's could be profitably and creatively used as the basis for philosophy courses, provided that the lecturer would integrate it with plenty of recent information.[36] Soon philosophical textbooks began to appear that embodied this moderate approach to the study of modern philosophy. These works, like Gaetana's notes, were characterized by a teleological ontology mainly derived from Descartes and Malebranche, an apologetic reading of Newton's natural philosophy, and a skeptical attitude toward the possibility of certain knowledge about any empirical state of affairs. Among the most popular of these textbooks were those by the Piarist Edoardo Corsini (1702–65) and by the Somaschan Giovanni Francesco Crivelli (1691–1743).[37]

The shift from traditional scholastic resources to modern ones is well illustrated in Corsini's *Institutiones philosophicae ac mathematicae ad usum Scholarum Piarum* (1731–34), which was designed to bring Piarist scientific teaching back on the scene after the seventeenth-century crisis. Corsini invited his students to prepare their final theses of philosophy by reading contemporary authors, and he defended the antidogmatic approach to natural philosophy as characteristic of the Piarist tradition and not in contrast with natural theology and metaphysics. It must be said that, to him, modern philosophy meant essentially Descartes and Gassendi. Newton, Locke, and Leibniz did not feature in his textbook, which makes it even clearer what an exceptional education Gaetana received. Corsini showed a particular interest in the teaching of mathematics, arithmetic, and practical geometry, and he himself acted as consultant on issues of hydraulic engineering. He would later shift his anti-Jesuit polemics to the area of antiquarian and literary studies; his enthusiastic re-evaluation of the Greek language and culture was indeed yet another blow to the Jesuit *ratio studiorum*.[38]

The textbook written by the Venetian Giovanni Crivelli was much closer to Gaetana's studies and interests and soon found a place in her library. Crivelli was a well-known author, his textbooks of algebra (1728) and Euclidean geometry (1738) being widely adopted in the schools of the Venetian Republic and in Somaschan colleges all over Italy. He reached important positions within his congregation, including provincial director and director of the Murano seminar. His *Elements of Physics* (1731) was an updated textbook of

natural philosophy that enjoyed a good editorial success. Crivelli had participated in the debate on *vis viva*, and was apparently planning to write a textbook of integral calculus for his students when he died in 1743.[39]

The Jesuit educational model was based on emulation and competition, which found their best expression in the academic dispute between two *aemuli* (rivals), be they individuals or groups. Students practiced the art of disputation from their early years at college. The best ones would compete publicly during major events and celebrations. At the end of their course, the students of philosophy and theology would prepare a list of concise philosophical theses (*theses philosophicae*) that summarized the most relevant topics of the course. The theses would be published and partially defended in a public ceremony.[40]

At the age of twenty, Gaetana concluded her philosophy course in a similar manner. The event was heralded to the literary republic with the solemn publication of her theses, under the title *Propositiones philosophicae,* early in 1738; it was dedicated to Gaetana's tutor Carlo Belloni, "viro nobilissimo et litteratissimo." She singled Belloni out for having guided her through her philosophical and mathematical studies, eulogizing his vast knowledge and religious piety. Nor did she miss the opportunity to remember the glorious past of the Belloni, who for five centuries had honored Lombard letters, Church, and civil life.[41] The *Propositiones* mapped Gaetana's curriculum, some of which she had already defended in the disputes carried out during the conversazioni organized by her father. The book contained 191 propositions, which were presented as a series of numbered statements, each one about a dozen lines long. Because of its very nature, the book did not add significantly to Gaetana's previous notes, neither in its structure nor in its contents. If nothing else, Gaetana's statements here are more rigid and less nuanced than in her notes. However, unlike letters and private notes, this book promoted publicly the scientific culture of the Catholic Enlightenment in Milan and thus deserves some attention.[42]

In the prologue, Gaetana reiterated the assertion of the fitness of women to study the sciences and the arts. Then she presented her theses following the usual order: logic, ontology, pneumatology, general physics, and particular physics. Gaetana got through ontology with a mere three propositions and labeled as "logic" what was really a series of basic epistemological considerations. She assumed that the supreme criterion for the truth of an idea was its "evidentness," defined in Cartesian terms of "clarity and distinction"

when it is inspected by the attentive mind.[43] Where evidence is lacking and there is no matter of religious dogma, then "opinion" can be exercised. The knowledge attainable in these circumstances can only be "probable" and similar to the truth (*verisimilis*). This was the case with the knowledge of natural philosophy, which was produced through disputative methods rather than through mathematical- demonstrative ones. Indeed, only in the realms of metaphysics and mathematics can true knowledge be derived with absolute certainty from what is already known.[44]

Gaetana's appreciation of Malebranche's apologetic version of Cartesian epistemology emerges repeatedly throughout the book. It shaped her treatment of the acquisition of knowledge, which she described as an essentially passive process in which the human mind does not "act" but only "perceives." She defined the very possibility of cognition in terms of a voluntaristic doctrine of God-as-mediator (God lets his creatures know through "illumination"). On the other hand, she rejected the belief that knowledge comes exclusively from sensation (a doctrine attributed to "Lokius"—that is, John Locke) as absurd.[45] Also, in treating the relationship between soul and body (in the section on pneumatology), Gaetana professed to find the doctrine of Malebranchian occasionalism the most reasonable and the best to reconcile reason with faith. She also referred to Newton's natural philosophy, which is defined as "*pulcherrima et simplicissima theoria*." She applauded the discovery of the laws of motion and illustrated some of their applications in ballistics, hydrostatics, and geostatics. She also praised the Newtonian "system" for its treatment of the natural history of celestial bodies and the nature of light and colors. However, Newton's presence in the book is less relevant than it is in her notes, and there is no reference to technical aspects of his works or to the *Principia*.[46]

Two points that would be crucial in Gaetana's later mathematical work emerged from these philosophical theses. First, like Malebranche, she combined scientific investigation with a fundamental apologetic meaning, not just in the sense that the design of creatures reveals their creator's hand; it was the faculties and practices involved in the scientific enterprise that were considered relevant to the spiritual life of the investigator, as exemplified by the notion of "attention." Second, she granted a privileged position to mathematics; she employed the term *scientia* exclusively for geometry and arithmetic. Indeed, while she presented every kind of empirical knowledge as essentially fallible and open to debate, she insisted that, in mathematics, one can discover and contemplate truths that are derived with absolute certainty

(*certissime*). She defined such intellectual contemplation, in accordance with the tenets of Casati's essay on ethics, as the greatest earthly joy available to mankind (*quo nihil jucundius esse potest*).[47]

In his pioneering study of the relationship between Enlightenment culture and administrative reform, Franco Venturi effectively illustrates the political meaning of early eighteenth-century philosophical debates over the nature and legitimacy of knowledge. Against this background, Venturi traces a genealogy of the Italian Enlightenment as a reformist thread that runs "from Muratori to Beccaria." In his perspective, Muratori figures as a key reformer but a timid one, who avoided pushing his reform program to its logical conclusions because he feared the possible retaliation of religious authorities. Being coherent with his principles would have implied abandoning any reference to the sacred scriptures in social and political matters—that is, taking religious beliefs out of the tree of knowledge. What we find in Muratori are the "initial elements of what would be the enlightened reform movement," the seed of the Milanese Enlightenment. Muratori lacked "the faith in reason, and the will to impose it" that characterized the next generation of Milanese reformers, that of Pietro Verri and Cesare Beccaria. Based on this view, the category of "pre-Enlightenment" comes in handy to make sense of Muratori and the Muratorian culture.[48]

Following Gaetana through her studies and early career should have made us wary of teleological reconstruction along these lines. The attempt to harmonize reason and faith, critical analysis and dogma, was not a pragmatic compromise but the very essence of enlightened Catholic culture. Muratori's assessment of the relationship between religious and empirical knowledge aimed indeed to offer a third way between Algarotti's materialism and Huet's fideism. Rather than being interpreted as a self-censored, mutilated reformism, the Catholic Enlightenment should be considered as a distinctive reform project for the renewal of both religion and society. Indeed, it should be understood as an alternative to what Venturi saw as the fully accomplished Enlightenment culture of the 1760s, rather than as its incomplete predecessor.

CHAPTER FOUR

Choices

As Brosses took leave of the Palazzo Agnesi on that night in July 1739, he was told something that surprised and disappointed him. Apparently Gaetana had expressed the wish to enter the cloister and don the sky-blue habit of an Augustinian nun. Brosses could not understand this choice, which indeed was an unusual one. "She is very rich," he commented in his last letter from Milan, implying that she could well have continued living the sparkling existence that had brought so much attention to the Agnesi conversazione. In fact, Gaetana had expressed the desire to abandon her life in society for the quiet of the cloister while she was carrying out her most celebrated public performances. Her friend and biographer Frisi effectively describes Pietro's immediate reaction to her request: "It was as if he had been struck by lightning." Pietro "did not dissimulate his sorrow at the idea of being abandoned by such a dear daughter, who was, more than the others, the delight of his life." It's unlikely that he would have been upset by the idea of a female member of the Agnesi taking the veil: two of his sisters and at least four of his daughters would enter the monastery. Rather, through the years the Agnesi conversazioni had been entirely constructed around Gaetana's public persona and her performances. At the moment when visibility was crucial to Pietro's strategy of social enhancement, he risked losing what had brought him to the elite's notice in the first place. Not surprisingly, Pietro was eager to discuss and negotiate.[1]

That Gaetana was suffering from the exceptional circumstances of her life had already been signaled by the "strange" and "persistent" disease that had struck her down between 1730 and 1732, at the climax of her career as a child prodigy. In 1739, during another period of repeated public appearances, Gaetana again manifested her uneasiness with the life that her father had been imposing on her. Frisi refers to long discussions between father

and daughter, with Pietro being remarkably understanding for a father of that period. Eventually, Gaetana agreed to maintain her lay status but only on certain conditions, which would make her life an unusually private one. It is unclear whether Gaetana ever intended to take the veil. The fact that she did not take this step despite surviving her father by almost fifty years suggests that she might have used this argument primarily to negotiate a different life.

First, Gaetana asked for the freedom to dress simply, thus cutting herself off from her father's conspicuous style. She also asked to be able to visit the church of San Nazaro and other city churches whenever she wished. Finally, she asked to be exempted from attending balls, theatrical spectacles, and other worldly amusements. Gaetana had therefore decided to separate herself from the sites and rites of social visibility, but she saw this as the first step toward a real and meaningful involvement with the *mondo,* the worldly life.[2] Believing that she was destined by God to live in the world and assist and relieve "suffering humanity," Gaetana asked to be allowed to volunteer at the Ospedale Maggiore, taking care of poor and infirm women. She had direct knowledge of the conditions of the urban poor, as the Palazzo Agnesi was in the midst of a medieval urban tangle. The Pantano quarter hosted noble palazzi like the Agnesi's and the Settala's, but also workshops, brothels, and overcrowded residential buildings. The sight of misery, prostitution, and infirmity was thus a daily experience for Gaetana, particularly in those years of war and economic depression. In similar conjunctures, the proportion of beggars in the city's total population could rise from the average 5 percent up to 20 percent. Families headed by single women and the elderly deprived of material support from their families seemed to be particularly susceptible to periodical crisis. Their precarious economic and social status was typically manifested in their relegation to the higher floors of buildings, in the insalubrious *sottotetti*. In his letters written in the summer of 1739, Brosses did not fail to report the impressive number of infirm crowding the streets of Milan.[3]

Pietro agreed to all of Gaetana's requests. In return, she promised to participate occasionally in the conversazioni, although there is no evidence that she ever performed a formal disputation again. Gaetana also promised her father that she would not abandon her studies and publications. However, she wished to give up the study of natural philosophy and deepen her knowledge of mathematics, the science that she favored above all others. Mathematics was hardly the subject for genteel conversation, Algarotti had warned.

Gaetana did not care any more: as 1740 began, her glittering public career was at an end.[4]

Gaetana was well aware of the new possibilities for action that had been opened up by the consolidation of enlightened Catholic culture in Milan. The movement had found particularly fertile ground in the city. Since the early years of the century, ecclesiastic institutions had been strengthened in the Milanese diocese, and a renewed religious fervor seemed to penetrate certain sectors of society. The pastoral model of Archbishop Borromeo, the attachment to the tenets of the Counter Reformation, and the campaign for religious and moral education were the pillars of this renewed ecclesiastical life. Increasing attention was paid to the education and moral rigor of the clergy, which became proverbial. The sober religiosity advocated by Milanese archbishops accorded relevance to both sensibility and reason; ideally, the believer was "to stay in the world without being of the world." They held that the highest spiritual achievements were open to the average person, not only to those living in the quiet of the cloister. This was a moderate and "civil" devotion, based on the recognition of the boundless mercy of God, a positive view of the human being, and confidence in the relevance of the action of believers in civil society. Congregations such as the Theatine, Barnabite, Somaschan, and Piarist and monastic orders such as the Dominicans and the Benedictines provided the Milanese archbishops with active support in their reform campaigns and in the shaping of the new model of active sainthood.[5]

The Muratorian program offered the Milanese Church a coherent set of resources to legitimate and plan the reform of its liturgy, its devotional practices, and its overall social function. Behind this urge for reform was the perception that the support for traditional social referents, such as the urban patriciate, was weakening. The renewed missionary spirit and the opening to politically marginal social groups—including women—was thus part of a broader attempt to forge new alliances within Milanese society. The increasing weight of the religious orders and congregations that catered to these groups and the contemporaneous decline of Jesuit hegemony over Catholic culture, from theology to teaching, should be understood as part of the same process.

Following her partial retirement from public life, Gaetana was now able to intensify both her spiritual practice and her missionary action. She also immersed herself in the study of the sacred scriptures, dogmatic theology,

and mystic literature. These disciplines had been marginal to her previous course of study, designed as it was to foster her career as a learned young woman. However, even in the colleges and universities, the philosophy curriculum was quite distinct from the theological path followed by those willing to enter the Church. Thus, after 1740, Gaetana began reading and discussing things that were beyond the bounds of the philosophy formally taught to college students. Her choice did not encounter resistance within the Milanese Church—quite the contrary. In support of her theological study, the local religious authorities gave her permission to consult the collection of the Biblioteca Ambrosiana as well as the Greek and Latin patristic texts preserved by the theologian Angelo Oltrocchi, later director of the city's Seminario Maggiore and a canon of the metropolitan cathedral.[6] Meanwhile, Gaetana's own library expanded with the purchase of new theological books and texts of contemporary apologetics. Her collection also included forbidden books, which could normally be acquired and read only with special permission from the religious authorities. Understandably, such permission was granted only to trusted scholars. There would soon be other concrete proofs of the credit that Gaetana enjoyed at the top of the ecclesiastical hierarchy in both Milan and Rome.[7]

Gaetana's theological study was only one aspect of her religious experience. She now devoted much of her time to the promotion of elementary teaching, catechization, and assistance to the poor and the infirm. Her action in these areas was grounded in the Muratorian vision of charity as the primary Christian virtue and the only possible foundation of human sociability. Gaetana's social work was indeed symbolic of the new lay and active sainthood advocated by enlightened Catholics.

Wandering through the city, Brosses and Loppin had noticed that in Milan "there is not a single crossroad or open space just a bit wide that would not contain a statue, a column or an obelisk, which makes for a pleasant sight." This remark reveals that the French visitors still found pleasant (*agréable*) what, within twenty years, neoclassical architects would judge esthetically repugnant and worthy of destruction. It also suggests that much of the meaning attached by locals to such objects escaped the foreign visitor. Obelisks and statues were topped by iron crosses that turned them into essential landmarks of the sacred urban landscape. The many signs and carefully traced boundaries of the "holy" city were mostly invisible to the foreigner who walked across them.[8]

That its inhabitants saw their city as permeated by a sacred dimension was not typical just of Milan, although sacred signs might have been unusually abundant there. All aspects of social life in eighteenth-century Catholic cities were structured around religious practices and objects, according to patterns that were disrupted only during the last quarter of the century. The Milanese diocese had an impressive religious infrastructure and, in the Catholic world, was second in importance only to Rome. Toward mid-century, the city of Milan alone, in which resided some 120,000 inhabitants, hosted more than two hundred churches, three hundred convents, and *pia loca* (pious places, i.e, religious and charitable institutions), including fifty female monasteries and the houses of thirty-nine religious orders.[9] However, the formal ecclesiastic institutions and pyramidal structure that connected the parishes to the Milanese Curia and the archbishop were only one aspect of religious life in the city. This was integrated by other significant but more fluid institutions, such as the confraternity, which gave partial legitimacy to requests and priorities emerging from all lower strata of Milanese society. The durability and stability of the hegemony of ecclesiastic and patrician elites over Milanese society was indeed grounded in an ongoing process of reciprocal adaptation.[10]

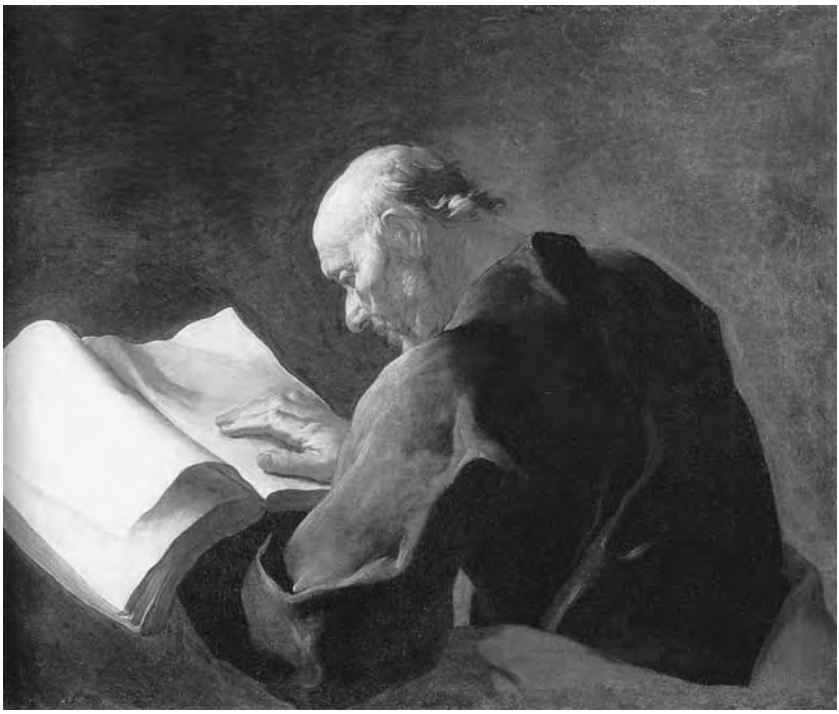
At least a quarter of city inhabitants were members of lay religious confraternities, some four hundred of which were still active in 1767. The confraternity was an extremely varied institution, built around the veneration of a sacred place or relic or promoting a particular type of devotion or religious practice. Membership in a confraternity was voluntary, and in most cases, access was limited by social status. Gender, age, occupation, and social rank were the most common criteria of selection. Most confraternities were small devotional companies active at the level of the parish or neighborhood. Some functioned within larger federations, which covered the entire city with a network of local companies. The federation of the Companies of the Holy Cross was typical of Milan, each company being attached to one of the many crosses that graced the city's squares, intersections, and marketplaces. Those living in the vicinity of the cross would be grouped together, each group having its own saint protector and a common burial ground. The companies were extremely territorial—long disputes are recorded regarding the invisible boundaries between their spiritual jurisdictions, marked by palazzi, churches, holy images, doors, even windows. The urban space was thus divided into sacred neighborhoods that were essential to the construction of their inhabitants' identities. Interestingly, the

number of these confraternities and their reputations were on the rise during the first half of the eighteenth century.[11]

Individuals could be members of more than one confraternity, and many joined those based on occupations. Silk weavers, bakers, leather workers, carpenters, coachmen, grooms, barbers, wig makers, musicians, servants, and college students all had their own confraternities. The merchants had theirs, too, as did the city elites, from magistrates to senators. Members gathered periodically for mass, spiritual exercises, processions, and specific religious practices, thus investing everyday social links with sacred meaning and contributing to the construction of social identities. In this way, the material culture of devotional practice anchored the Milanese deeply to their city and was an essential aspect of the functioning of this ancien régime society. Most confraternities were run by lay members or, more rarely, by members of the clergy. This was the case of the confraternities organized by the Jesuits, which catered mostly to the elites.

The Congregation of the Holy Sepulcher—or *Entierro,* from the Spanish word for burial—included members of the government, generals of the imperial army, the great aristocracy, as well as high-ranking Spanish and Austrian nobles. Like many other confraternities, it had a particular association with the themes of a good death and the rite of burial. Its members gathered only nine times a year, at night, in the crypt of the Jesuit church of San Fedele. The *Entierro* was renowned for the impressive baroque spectacle of its celebrations and performances. Prayers and spiritual exercises alternated with sacred cantatas about the passion of Christ and the sorrow of the Madonna Addolorata, which were specially commissioned by the *maestro di cappella* of the congregation, a position occupied by Giovanni Battista Sammartini from 1729 to the suppression of the Society of Jesus in 1773. The moment of highest public visibility for the congregation was before Easter, when it presented cantatas and a solemn procession on Good Friday. This began at night, and representatives from the entire city paraded, accompanied by lights, music, chants, banners, and "machines"—altogether probably the most impressive spectacle ever seen in eighteenth-century Milan. The *Entierro* gave a structure to the relationship between the multinational Milanese elites and the distant court, while reinforcing the perception of social hierarchy through the symbolism of baroque scenery.[12]

At the social spectrum's other extreme, the religious practices of many popular confraternities were hardly encouraged by civil and religious authorities. For one thing, unlike the parishes—the basic unit of both social



Giuseppe Antonio Petrini, "Filosofo" (circa 1735). From *Giuseppe Antonio Petrini,* ed. Rudy Chiappini (Milan: Electa, 1991), 161.

and religious life—they were not easily controllable. Moreover, the baroque piety of confraternities and their sometimes obscure devotions were continuously at risk of trespassing on the limits of orthodoxy and entering into idolatry and superstition. Throughout the century, archbishops and governors repeatedly condemned the nocturnal gatherings of popular confraternities meeting by the light of votive lamps, as well as their "refreshments," music, and promiscuity. From time to time, confraternities were discovered that had never been heard of, let alone sanctioned, by the authorities.[13]

Gaetana, whose religious sensibility had matured through the practices of Theatine ascetic spirituality, was extremely wary of "disorderly devotions" (*sregolate devozioni*) and theatrical piety. One of the key ideas that she had defended in her philosophical theses was the essential role of reason in spiritual life. She believed that baroque piety and superstitious devotions stimulated and relied on fantasy and imagination rather than intellect. They in-

duced a credulous and fatalistic attitude rather than a clear understanding of one's religious duties, thus compromising the spiritual experience of the believer. However, she was well aware of the opportunities for social action provided by the existing network of lay congregations, so she decided to use these to promote the new models of enlightened Catholic religiosity.[14]

Despite the scant evidence, we know that Gaetana joined the Congregation of the Schools of Christian Doctrine,[15] a federation of local, parish-based companies that ran catechism schools for boys and girls. The Schools of Christian Doctrine had been founded in Milan in 1536 to provide basic religious instruction to the poor. Endorsed by the Council of Trent and supported by Archbishop Borromeo, they spread rapidly through Italian cities and towns. By 1599, Milan alone had about one hundred twenty such schools catering to 7,000 boys and 5,750 girls; their number surpassed two hundred by the middle of the eighteenth century. Lay confraternities operated the schools, while the central congregation organized major processions in which each school paraded carrying catechistic symbols. The congregation would also hold an annual public demonstration of its pupils' ability. Grouped in the church of San Dalmazio, the children would engage in a series of public disputations, with specially commissioned sacred cantatas as musical intermezzi.[16] Here the term *disputation* meant a set of answers on points memorized from the catechism. Mimicking college practice, the winners were awarded prizes—in this case, holy images and prayer books.

Boys and girls went to school in different churches and were taught by teachers of their own gender. The sight of women teaching in churches had initially raised some eyebrows, but the confraternities promptly replied with historical and pragmatic arguments.[17] The catechistic teaching was identical for the two groups, as explicitly pointed out at the beginning of their textbooks. These normally included the *Summario,* on which children learned to read, and the *Interrogatorio,* a catechism in the form of questions and answers. The first textbook opened by teaching the hand movements and words of the sign of the cross, then presented lists of prayers, sins, virtues, and other religious information to be read aloud and memorized. The second, the catechism, contained everything a good Catholic needed to know, presenting the basics of Catholicism in a simple and unproblematic way, insisting on the need to combine faith with good works. It did not look deeply into any theological issue or attempt to justify the Catholic faith; controversy was avoided and the existence of Protestantism was simply ignored. A few

Alessandro Magnasco, "Il catechismo in chiesa" (circa 1725), detail. From *Pittura a Milano: dal Seicento al Neoclassicismo* (Milan: Cariplo, 1999), 161.

selected pupils aged fifteen or more continued their studies with prayer manuals and more sophisticated catechisms such as Bellarmino's.[18]

Originally these schools were the expression of a society characterized by high social mobility, endorsed by powerful merchant groups that played an important political role in the life of the cities and towns. The Schools of Christian Doctrine had emerged as the integration of the medieval *scuole d'abaco* for artisans and merchants with the renewed missionary spirit of the post-Tridentine Catholic Church. While providing essential literacy and numeracy skills, they would also "impress Christ on the blank minds of children."[19] It is not a coincidence that the Milanese diocese provided fertile ground for the schools and became a model for other dioceses. On the one hand, it hosted wealthy merchant communities; on the other, its jurisdic-

tion extended into Switzerland, whence the threat of Protestantism was perceived as extremely strong.

Throughout the seventeenth century, at the same time as the Italian aristocracies were becoming closed off socially and politically, concern about the consequences of the diffusion of education through large strata of the population became common among the ruling patrician elites and within the Church. The model provided by the Jesuit system of education became standard, and as we have seen, it did not include primary teaching. Instead, it started with the rudiments of Latin, assuming that children would have acquired the necessary reading and writing skills elsewhere, normally through private tutors. Meanwhile, the Schools of Christian Doctrine limited their teaching to the most basic elements of reading and catechism, producing only precarious and often temporary literacy. The creation and maintenance of this crucial gap between free popular education and entry-level college education was yet another mechanism for social exclusion implemented during the century. The punishments inflicted on unauthorized teachers and the progressive drying up of noble patronage for schools for the common people can also be read as signs of the new attitude. The difficulties experienced by the Piarist order in the second half of the seventeenth century, apart from the Galileo affair, had much to do with its successful schooling activities throughout Catholic Europe and with its alternative educational policy.

When Gaetana began to teach in the Schools of Christian Doctrine in the *sestiere* of Porta Romana, it was uncommon for members of the aristocracy to help keep them going. Rather, their functioning was ensured by the social groups that sent their children to them to be educated: small merchants, artisans, shopkeepers, and the various *popolo minuto* (low people). Legacies mostly came from within those groups. Also, the number of female personnel had increased, with young celibate women teaching and the wives of patrons—merchants and professionals—often taking care that street children attended school.[20] The Milanese Church explicitly encouraged lay women to support the schools and also reinforced those religious orders, such as the Ursuline nuns, with a tradition of teaching young women. At the same time, patrician ladies had increasingly distanced themselves from these confraternities, considering it inappropriate to actively support them.[21]

Gaetana had received permission from her father to go to church when-

ever she liked. Pietro soon realized that, for his daughter, this meant not just praying but also teaching. She taught young girls in the small church of Santa Caterina, a few hundred yards from her paternal home, and in San Calimero, a parish across the Porta Romana *corso*. On each school day, she would "unfailingly" be among the children, in a corner of the church where benches could be arranged in a circle. Gaetana, standing at the center, would use the figures and words from the catechism to teach them how to read, as well as big boards with letters on them. Pupils ranged in age from five to fourteen, and were divided into three progressive classes; occasionally, illiterate women would also join the classes. Gaetana would normally teach for a couple of hours in the afternoon. The schools were open on Sundays and on holidays, which counted for a total of at least eighty-five days a year. Eventually Gaetana became Priora della Dottrina Cristiana, Prior of the Christian Doctrine, or school director, with responsibility for teaching the essentials of the catechism, verifying the progress of each child, and judging whether and when they were ready to receive the sacraments. She also trained other teachers and directed the volunteers who made up a Compagnia Operaia Catechistica, the company in charge of cleaning the premises, providing a bucket of drinkable water for the children, and in the morning before each teaching session, walking through the neighborhood to "fish"—so they said—for street children and take them to church.[22]

The other charitable activities of the famed *filosofa* also took place in the local confraternities. The most remarkable was her volunteering beneath the high vaults of the Ospedale Maggiore, the great public hospital known to the Milanese as Ca' Granda, the Great House. Far from being exceptional, as suggested by some later apologetic biographers, the involvement of wealthy gentlemen and ladies in the material and spiritual assistance of the hospitalized infirm was, in fact, the defining aim of numerous confraternities; we know that at least one of them was based in the church of San Antonio and another in San Nazaro.[23] If Gaetana's commitment was perceived as out of the ordinary, it was because of its intensity rather than where she exercised it, and because of its exemplary combination of Muratorian charity and antibaroque ascetic.

On an average day, Gaetana would attend an early mass in San Antonio, accompanied by "a simple servant," and then would meet Giuseppe Reina, her spiritual adviser and the director of the Theatine House. Twice a week she would confess and receive Communion. Much of the day would then be

spent at the public hospital, where she assisted old and chronically infirm women. She would then pay visits to the infirm who lived in the poor estates in the parish, providing them with material and spiritual assistance. To those who needed somewhere to stay, Gaetana opened the doors of her palazzo, where she had transformed a few secluded rooms into a small-scale infirmary.

As more and more chronically ill women entered the gates of the palazzo, Pietro decided to intervene. He limited the number of patients that Gaetana could assist inside the house and insisted that she pay more attention to her appearance. A portrait of Gaetana dated around 1748 shows her with pearl earrings and a fur neck, but her hairstyle is unusually simple and practical for a wealthy Milanese lady of the time. Gaetana also continued to appear at her father's conversazione from time to time. Those who knew her well were mystified by how easily she could switch roles when she entered the salon. Apparently, even after a day of intense work in the hospital, she was able to transform herself just by passing through the door. "She intervened in the usual domestic academies with cheerful and tranquil appearance," Frisi remembered, "and proposed or answered questions, problems, and scientific riddles with such a grace and penetration that the group of discerning admirers grew greater every day, rather than diminishing."[24]

Consistent with her belief that charitable and religious practice should be coupled with study and intellectual exercise, Gaetana spent long hours at the books she kept acquiring. Freed from the limits of her previous curriculum, she could now concentrate on what she thought was really essential. While natural philosophy remained a topic for conversation, it seems to have lost relevance in Gaetana's eyes, as did the apologetic strategy of natural theology, which had emerged in various passages of her philosophical theses. Instead, she worked hard to deepen her knowledge of contemporary mathematics, whose techniques she invested with particular spiritual and pedagogical significance. Focusing on pure mathematics was by no means an obvious choice. Other enlightened Catholic authors, and Muratori himself, valued modern mathematics primarily because of its practical applications. Not so Gaetana, who, as we shall see, considered pure mathematics to be a fundamental element in the education of Christian youth.[25]

In 1740, she was still working on her essay about l'Hospital's treatise of analytic geometry, aiming to clarify its difficulties and ambiguities for the benefit of young students. She had not been encouraged by her tutors to

take on this particular task or, more generally, to concentrate her efforts on mathematics only. Belloni himself, who was keener than the others on these studies, had half-jokingly advised Gaetana against embarking on this mind-boggling and scarcely rewarding enterprise. If anything, this made Gaetana even more determined to contribute to the pedagogy of the mathematical sciences. And her enthusiasm increased when she met, probably through Stampa, an Olivetan monk who had just arrived in Milan to teach geometry to the novices of his order at the monastery of San Vittore in Corpo. Ramiro Rampinelli had studied with famed mathematicians in Bologna and Padua, and although he was now lecturing on Euclidean geometry and optics, he was aware of recent developments in the field. Gaetana asked him to instruct her in the techniques of Leibnizian calculus, and the monk declared himself ready to teach her what he knew.

It is interesting to compare Gaetana's existential choices, her cultural and religious inclinations, and her role in the Agnesi conversazione with the experience of another exceptional lady who lived in Milan in those years: Countess Clelia Borromeo del Grillo (1684–1777), a Genoa-born aristocrat who had married into the powerful Borromeo family. For years she hosted a lively conversazione, frequented by local literati and prestigious visitors from all over Europe. According to writers such as Montesquieu, Clelia would entertain her guests in the wing of her palazzo with her extraordinary wit and education—which ranged from the classical and modern languages to mathematics and experimental sciences—and would offer them both theatrical spectacles and scientific experiments.

In about 1719, Clelia decided to found a scientific academy that would focus on the mathematical and experimental sciences, while banning poetry. She invited the famed Antonio Vallisneri, whom she had previously visited in Padua, to write the constitution of the newborn academy. Her fervor for Vallisnerian theories was such that she even offered to send her thugs to "beat up or slash the face" of one of the Paduan professor's scientific opponents.[26]

The Somaschan Giovanni Crivelli and the Camaldolese Guido Grandi were associated with Clelia's academy as the "correspondents," while the main representatives of Jesuit mathematics in Lombardy at the time—Tommaso Ceva, professor at Brera College; Girolamo Saccheri, professor at the University of Pavia; and his successor, the Jesuit Giulio Cesare Brusati—attended regularly at its meetings. The cultural program of the Accademia

Clelia dei Vigilanti aimed to introduce to the Jesuit *ratio* themes and methodologies from the area of the Catholic Enlightenment. However, the project met significant resistance, both inside and outside the Society of Jesus. There is no evidence that Clelia's academy was ever fully operative, and by 1726 Vallisneri was already talking about it in the past tense.

Those same local authorities who would endorse the Agnesi conversazione seemed quite skeptical about Clelia's academy and possibly contributed to its early demise. It was no mystery that she had little sympathy for the Austrian rule and hoped for the return of the Spanish, never missing an occasion to quarrel spectacularly with the governor's wife during the afternoon *corso*. The aristocratic character of Clelia's academy, its baroque program for the investigation of curious natural phenomena, and the fact that it closed its doors to technical and professional groups were also important factors in its failure. This was symptomatic of the crisis in a much broader political and cultural movement, which envisaged the restoration of Spanish hegemony over the Italian states and the rescue of the traditional Jesuit system of knowledge and education.

As a result of the destruction of the main bulk of her correspondence, Clelia herself remains rather mysterious. She was certainly a devout Catholic, although a rather eccentric one, who was fascinated by the theatricality and baroqueness of Jesuit piety. The black-dressed Madonna Addolorata surrounded by human bones in San Bernardino was her personal homage and a sign of her adherence to the seven sorrows devotion. On the other hand, Clelia read and admired Vallisneri and other enlightened Catholic authors, and she thought it was important to create new institutional spaces for the cultivation of experimental physics in Milan. Her project for an academy looks like an extreme attempt to keep together the many strains of Catholic culture at a time when they were, in fact, disintegrating.[27]

There were other, similar attempts to renew scientific culture in Milan without breaking the boundaries of the Jesuit system. In 1702, Count Carlo Archinto opened a private academy with the aim of studying natural philosophy, experimental physics, mathematics, and history. Archinto, owner of one of the most remarkable libraries in the city, made his collection of scientific instruments available to the academicians, which included Milanese patricians and those same Jesuit scholars who later gathered around Clelia. The Archinto family was very close to the Society of Jesus—Carlo himself had studied in its schools at Brera and Ingoldstadt. Girolamo Saccheri dedicated his *Logica* to Filippo Archinto, Carlo's father, who had probably been

influential in the professor's appointment to the chair in Pavia. By 1706, however, the academy had been disbanded. The only known dissertation produced by it was—significantly—one on metaphysics.[28]

Borromeo and Archinto were both exponents of the philo-Jesuit and philo-Spanish party in Milan. Their attempt to open Catholic culture to the new experimental physics and the new mathematics failed primarily because they were intended to operate within a Jesuit cultural framework, involving only the traditional social referents of the Society of Jesus. Instead, conversazioni like the Agnesi's were acting as sites for the mediation between religious reform and emerging social groups, under the benevolent eye of the Austrian government.

In 1746, Clelia fled Milan for the Venetian Republic to avoid arrest and the accusation of treason in favor of the Spanish. She would return to her palazzo a few years later, following her reconciliation with Empress Maria Theresa. Meanwhile, Gaetana was devoting her new life mostly to charitable activities, the study of mathematics and theology, and spiritual exercises. She still managed to frequent a few select conversazioni, though—in particular, those of a group of like-minded literati who had set up a new literary academy called the Accademia dei Trasformati (1743).

The Trasformati came into being primarily in reaction to the activities of the Arcadia Society, which, from around 1700, had played an essential role in shaping the relations between the Roman Curia and the cultural elites scattered throughout the Italian peninsula and operating under a variety of different governments. Founded in Rome under Pope Innocent XI, the Arcadia had presented itself from the beginning as a model for cultural practice. Through it, the Roman Curia intended to reassert its hegemony over Italian culture, at a time when unorthodox interpretations of the rationalist and experimental philosophies were multiplying. Thus, the Arcadia promoted certain organizational and cultural practices while excluding others. Its structure was decidedly vertical, with the Roman see at the top, faithful interpreter of the Curia's cultural policy. According to its creators, the flow of information should move from the top down, from Rome to the numerous branches—or "colonies," as they were called. The colonies were not supposed to interact with one another, but only through the mediation of Rome, which was also responsible for the selection, recognition, and publication of members' work. Essentially, the Arcadia promoted a rococo esthetic associated with a form of moderate rationalism, which took on board the out-

comes of recent philosophical discussions while delegitimizing an array of potentially dangerous interpretations.[29]

The complexity of the Arcadian experience is far from being reducible to this hegemonic strategy, however. The pontificate of Clement XI (1700–1721) saw the Roman Curia's extreme attempt to regain its power to guide the development of modern knowledge. But the very emergence of Muratorian reformism illustrates the variety of cultural positions within the Catholic Church and within the Curia itself. Muratori's model of cultural organization can be interestingly contrasted with the Arcadian model. Muratori's "literary republic of Italy" emerged from the recognition and legitimizing of existing networks of correspondence between Italian and European literati. Muratori himself, with 2,093 recorded correspondents from all over Europe, was an important node of this network. The contrast between this decentralized and horizontal network—which was considered by enlightened Catholics to be the best mechanism for facilitating the circulation of "literary news" within the peninsula—and the rigidly vertical structure of the Arcadia Society was stark.[30]

Overall, it is clear that the Arcadia was far from successful in imposing its cognitive and moral values and that a variety of different experiences were organized under its patronage. The space between formal rules and actual practices has been fruitfully investigated in detailed case studies such as those on the Bologna colony. Here local cultural projects exploited the protection and promotion granted by the Arcadia, turning the colony into a site for negotiation between local elites and Rome's religious and political authorities. The practice and teaching of pure and mixed mathematics at the Academy of Sciences of Bologna thus assumed forms that were consistent with the Arcadian model, although their promoters were pursuing a significantly different program of research. The apparently normalized experimental and philosophical culture of the Bolognese Academy also provided opportunities for Francesco Algarotti's experiments on the nature of light and colors and thus for the elaboration of alternative interpretations of the new sciences and of their relation to society.[31]

That similar dynamics might have existed in Milan is suggested by the fact that most Trasformati came directly from the ranks of the Arcadia Society. Unlike Bologna, Milan did not have any stable institutions to support the practice of the experimental sciences. There were good public schools and colleges of education, but the closest university was in Pavia, and the teaching of experimental physics there began only with Manara's appoint-

ment. There was no academy of sciences in Milan, nor any comparable site for the practice of experimental philosophy. This meant that individuals could not be sheltered by prestigious institutions and so had to rely more directly on the patronage of the Arcadia, which was indeed the most reliable source of protection and legitimization for literary activities in the city. In this context, it is all the more remarkable that the colony should have closed down in 1732, to be replaced by a few surviving private salons and, from 1743, by the Trasformati.

That the Trasformati wanted, from the beginning, to distance themselves from the Arcadia was clear from their very name—the "transformed ones." Their intention became all the more obvious with their public rejection of the offer made by the central body of the Arcadia Society in Rome that they join its ranks as a new colony, which would have enabled them to benefit from Arcadia's protection and institutional structure. Instead, the Trasformati aimed, ideally, to follow in the footsteps of a sixteenth-century Milanese academy that had borne the same name. This older academy, set up by noblemen interested in the natural sciences and medicine, had striven to diffuse the cultural values of humanism in civil society and among youth, mainly though public lectures and libraries.[32]

The new Trasformati began gathering in the house of Count Giuseppe Imbonati (1688–1768), with the commoner Carlo Antonio Tanzi (1710–62), a dialect poet, as their permanent secretary.[33] Among them were some of the most prominent figures of Milanese culture: poets, essayists, playwrights, professors, and ecclesiastics from various orders. As with other Milanese academies, and the Arcadia itself, women were also admitted. The need to use a natural style in literature, the defense of the Italian language and of the Milanese dialect, and the history of local traditions were favorite themes of discussion among the academicians.[34] The academy met weekly to discuss literary news; it held special meetings from time to time to discuss relevant issues; and three times a year, it held large public meetings at which prolusions and poetic compositions were read.

The publication of the academy journal *Raccolta milanese* began only in the 1750s and was short-lived, but its pages recorded dissertations from previous years, on topics including medicine, law, natural philosophy, and social policy. A recurring theme in these academic works was the perceived decadence of Italian culture and society. War and internal feuds were the common culprits, but the traditional education system, the pre-eminence of

Latin, and the way in which philosophy and theology were taught at universities and colleges were also singled out. The academicians cultivated satire, in particular, which they directed primarily at the moral and cultural degeneration of the Italian aristocracies. Other recurrent themes in Trasformati publications were the scandal of the castrati, the increasing number of women entering the cloister, and the excesses of baroque religious ceremonies. Reform was recommended for all these, along the lines of enlightened Catholicism. Thus, Italian should replace Latin, more space should be given to the modern sciences and to modern history in curricula, and textbooks should be written in a plain, natural language, as bad style would impede the diffusion of modern knowledge.

It is not surprising to find a disciple of Michele Casati defending these ideas among the Trasformati: the Piedmontese Pier Domenico Soresi, whose own education had been a true experiment in Muratorian pedagogy. His essays and poetical compositions, which celebrated equally "the triumph of religion" and "the advancement of the sciences," with San Gaetano and the Theatines as the new apostles, outlined the need to increase patronage for letters and to promote reading, the need to replace superstitious beliefs with the knowledge of modern physics.[35] Under the patronage of the Trasformati, Soresi also published an Italian grammar for students. The Trasformati emblem was on the first page: a plane tree with branches full of apples, indicating that, with proper grafting, even a sterile tree can bear fruit (a visual representation of Virgil's line: *et steriles platani malos gessere valentes*).[36]

Soresi articulated the Trasformati's position on public education and the education of women, arguing that educating the large mass of lower-class children was more important to the well-being of the country than the education of aristocrats and the well-off, and it should become a political priority for any government. He suggested that children from all backgrounds be equally instructed in religion, reading, writing, counting, and drawing. Then, depending on their family circumstances, they could either continue their studies or take up a job or an apprenticeship. The catechism should be taught in Italian, abandoning all scholastic abstractions, and emphasis should be placed on the immediate relevance of evangelistic teaching for guiding Christians in their social lives. Reading and writing should be done exclusively in Italian, as the use of unfamiliar languages inevitably delays the learning process. Pedantry, fear, and punishments, Soresi claimed, should be replaced by clarity and cheerfulness if one wants to retain stu-

dents from the lower classes. As their abilities grow, students should read more sophisticated catechisms and "books that treat of agriculture and the mechanical arts in a practical way" and learn practical arithmetic. Focus should thus be on the practical education for the artisan classes, and the general tendency to channel the best students toward the priesthood and theological studies should be limited. Such arguments were clearly inspired by Muratori, who, in his *On Public Happiness,* concluded a chapter on logic and metaphysics by exclaiming: "What a great philosopher must have been who invented the knitting machine!"[37]

In the mid-1740s, the church-filling sermons of another *trasformato,* friar minor Pierantonio del Borghetto, generally agreed with Soresi, as did the works he published under the banner of the plane tree. Borghetto was a fervent admirer of Archbishop Borromeo, who, in his view, had reformed the clergy effectively and disciplined the Milanese—a "free, dissolute, and corrupt people." A celebrity who toured Italian cities to deliver his much-requested Lenten sermons, Borghetto scorned those conservatives who said that it was inappropriate for an ecclesiastic to deal with light and entertaining themes and who criticized him for not thinking twice about writing *Eulogy of the Tavern* for his friends, the Trasformati, or joking that the cowl prevented him from paying his respects to high-ranking ladies. Writing to his nephew who was taking the vows, Borghetto recommend that he study oratory techniques and philosophy. Himself an avid reader of contemporary natural philosophy, Borghetto invited the boy to cultivate a "love for the sciences" but always to consider them "means and instruments of the Christian virtues."[38]

Gaetana first met Archbishop Giuseppe Pozzobonelli at a Trasformati meeting shortly after his magnificent entrance into Milan in 1744. His appointment had been enthusiastically received by the Trasformati, who recognized in him a champion of moral rigor and religious reform. In fact, Pozzobonelli's early pastoral activity had been thoroughly representative of enlightened Catholicism. He had encouraged the foundation of new companies devoted to the teaching of catechism to boys and girls, while regulating and moderating traditional forms of popular devotion, which were replaced by a sober spirituality grounded in the connection between devotion and charity, very much in line with Muratori's "reasonable devotion."[39]

The climate of religious reformism that pervaded Milan and Lombardy in those years was effectively translated in pictorial form by Giuseppe An-

tonio Petrini (circa 1677–1755). His antibaroque style and interest in representing states of religious and intellectual absorption aimed to celebrate and promote a religiosity built on the values of the Catholic Enlightenment. Petrini's pictorial style is remarkably distant from the products of the canon of contemporary decorative rococo, which was characterized by the brilliant colors and mobile forms of the much-celebrated Venetians. Art historians have described Petrini as an *anti-Settecentista,* an isolated figure who seems to have looked backward rather than toward his contemporaries. Petrini's stylistic and thematic models are to be found primarily in the seventeenth-century Lombard naturalist tradition, best expressed by Caravaggio and his followers. Petrini revisited Lombard naturalism, adopting its compositional simplicity and use of real-life popular models as well as its visionary power, metaphysical depth, and essential connection to Borromean Counter Reformist religiosity. His contemporaries considered Petrini a "speculative painter," unlike mainstream rococo painters, who were concerned with exteriors: Petrini's paintings lacked pathos and theatricality and focused instead on the rendering of the psychology of the individuals portrayed. The colors were cold, the composition essential, the backgrounds austere and mostly abstract, while light was used effectively to enhance the visionary dimension. Not surprisingly, his works remained outside the main networks of the European art trade. Instead, Petrini found strong support within local communities between southern Switzerland and northern Italy, and he was soon commissioned by the Somaschan college of Lugano and by a few wealthy families such as the Riva, whose fortunes had grown during the past century and who were now enhancing their social position within the cultural and religious framework of enlightened Catholicism.

The Riva family played a crucial role in creating connections between Petrini, Muratorian reformism, and the modern sciences as taught at Somaschan colleges. Giovanni Battista Riva, who would become general of the Order of Somascha in 1741, and his brother Giampietro were among the promoters of the reform of the Somaschan *ratio studiorum* and were in direct contact with Muratori, the Milanese circle of the Trasformati, and the Academy of Sciences of Bologna. In the 1730s, in correspondence with his Riva patrons, Petrini strengthened his unusual stylistic characteristics and coupled them with significant thematic developments. New characters entered his repertoire, including figures of philosophers, astronomers, and mathematicians. There is no rupture with the predominantly religious themes of Petrini's paintings, however; these lay figures are actually trans-

Giacomo Ceruti, "Donne al lavoro" (circa 1725). From *Giacomo Ceruti: Il pitocchetto* (Milan: Mazzotta, 1987), 94.

figurations of his evangelists and saints. It is worth noting that, in his works, saints and philosophers alike are usually captured in that particular state of absorption that was considered by enlightened Catholics to be a prerequisite for the exercise of "attention" and, therefore, for the acquisition of both true knowledge and divine enlightenment.[40]

At the time of Pozzobonelli's appointment, the Milanese Church was still being shaken by the polemics that had followed the publication of *Politics, Law, and Religion in Order to Reason Correctly and to Distinguish Truth from Falsehood* (1742), a book printed in Milan with the approval of local political and religious authorities.[41] Its contents raised a heated debate and were crit-

icized in numerous anonymous pamphlets, written mainly by Jesuits and members of the monastic orders.[42] The Milanese archbishop asked a few select scholars to read the book's allegedly incriminating theological claims and report confidentially about their orthodoxy. In July 1742, the Roman Congregation of the Index condemned the theological section of the treatise, but this did not stifle debate on the book, which continued for another couple of years. The matter was extremely delicate, as it had direct bearings on the reform policy of the Milanese Church and on its relations with both Vienna and Rome. Confidential reports about it were signed by such figures as Giuseppe Antonio Sassi, director of the Biblioteca Ambrosiana and one of the most eminent Catholic scholars of his time. It is rather surprising to find among these reports one signed by twenty-four-year-old Maria Gaetana Agnesi.

The author of the controversial book was Marquis Giuseppe Gorini Corio (1702–68), a writer of moral treatises, books on meditation, edifying theatrical pieces, comedies, and tragedies. Gorini had already been banned in 1740 from volunteering at the Ospedale Maggiore because of his unorthodox views on religion. Throughout the book, he expressed jurisdictional views, arguing for clearer distinctions between the state, the sovereign, and the Church. According to his critics, he was too enthusiastic about Protestant and Jansenist arguments, and he wanted to restrict the jurisdiction of the ecclesiastical authorities excessively while strengthening the authority of princes. Furthermore, a section of the book was devoted to denouncing relics, martyrs, and false miracles, as well as debunking the Crusades as merely predatory wars.

While most of Gorini's themes were, in fact, popular among enlightened Catholics and were clearly inspired by Muratorian reformism, his relationship with Tagliazucchi and Muratori remained good only until the publication of the book. At that point, Muratori distanced himself neatly from some of Gorini's propositions, which he judged plainly heretical. The secular authorities were equally unhappy with the book—particularly its section on the right to resist princes—and, as a result, Gorini was arrested and briefly detained.[43]

Gorini did not lack initiative. He had previously dedicated his theatrical pieces and moral discourses to the emperor, to the pope, and to God. These works are informed by a rather traditional moral doctrine, centered on the cardinal virtues: prudence, justice, temperance, and fortitude. Only by cultivating these Christian qualities, he said, could the aristocracy legitimize

its power in the new century, and he never missed any occasion to chastise the nouveaux riches for overspending to gain social visibility. The cardinal virtues must guide both the *vero cavaliere* in the administration of his household and the prince in that of the country. As for the aristocratic lady, she must be "of few words, and apt to her status"; so, for example, thinking about and discussing science or politics would be highly improper. Overall, the more she is invisible and silent, the better, as all her energies must be devoted to the house and the children. Gorini's theater pieces, which included a musical drama put to music by Christoph Gluck, were successfully presented at the Teatro Ducale in Milan. That some of them were also staged at the theater of the Jesuit college simply underlines their overall moral conservatism.[44]

Gorini, however, associated this moral discourse with a general rebuttal of scholasticism, and he had an evident interest in modern philosophy, particularly Cartesianism and the sensationalist theories of knowledge. At the bottom of many of his controversial claims was the belief that religious dogmas and moral rules are in such accordance with natural reason as to make revelation redundant—a belief that was diametrically opposed to the epistemological choices of the Catholic Enlightenment. The power of natural reason and the scope of its jurisdiction were also the basis of his later (1756) "physical and moral treatise" on human nature. Here he elaborated on a sensationalist theory of knowledge inspired by Locke and Condillac and by David Hartley's associationism. The book was reasonably successful and was translated into French as *L'antropologie* [sic], but in 1759, it, too, finished up on the *Index,* despite the author's protestation of a sincere Catholic faith.[45]

In her notes for the archbishop, Gaetana wrote that Gorini treated many truths of the Catholic faith effectively. However, she did not miss the potential dangers inherent in the way in which he built his arguments, and added that "some points are made which are pernicious." She showed how Gorini, in the guise of condemning false miracles and superstition, was contradicting both the fathers of the Church and the official Tridentine catechism in many vital aspects, such as the role of the Holy Virgin as mediator between Christ and humanity. Gaetana drew her own authority in these judgments from the scriptures, the fathers of the Church, some late scholastic authors, the Augustinian tradition, and the writings of the intransigent Cardinal Vincenzo Luigi Gotti (1664–1742), whose opinions she held in high regard. Recent Jesuit theology was noticeable by its absence. Because

she was aware of the importance of the vernacular in the diffusion of knowledge, Gaetana was particularly distressed that Gorini had written his book in Italian, "the language familiar to the people." This would make it easier for him to "perturb" the faith of those "less protected"—that is, those who lacked a sound Christian education.[46]

These notes also reveal Gaetana's inclination to distinguish between epistemological levels, in which different kinds of knowledge are achievable, and her suspicion of any unrestrained application of mathematical methods and criteria. Thus, defending a sober cult of the relics, she noted that Gorini made an unreasonable demand for "proofs": in such historical matters, she argued, "moral certainty" is all one can ask for. She thus found particularly annoying Gorini's recurrent expressions: *mettere sotto i sensi* (to investigate through our senses) and *sottoporre a calcolo* (to reduce to calculation). These symbolized his ambition to apply empirical and mathematical problem-solving techniques to all spheres of human action, including religion. This attitude was precisely what the young Milanese reformers who gathered in Gorini's villa during the 1760s found most inspiring.[47]

If her comments on Gorini illustrate Gaetana's theological competence and ability as a controversialist, other religious manuscripts, discovered only after her death, speak of her remarkable mystical vein. We know that Gaetana wrote a few commentaries on patristic literature and composed a collection of prayers and meditations, which she left to an unknown lady at her death, but these texts are lost. Other religious texts now among her manuscripts are probably not hers.[48]

What is certainly in her handwriting is a large fragment of a manuscript entitled "The Mystic Heaven," a guide to contemplative practices leading to union with God. In this, Gaetana invites the "contemplative soul" to meditate on themes from the life of Christ, to share his suffering and his virtues, and to ascend from stage to stage toward the final "mystic marriage" with Christ himself.[49] She makes effective use of the metaphor of the soul as a mirror (of the passion of Christ) that offers itself to the "purest gaze of the spirit," and of the soul as the "loving bride." The style and themes are then related to a mystical tradition that exalts the personal love for Christ and the contemplation of his death and resurrection. Gaetana is clearly drawing not only on Avellino, Scupoli, and the tradition of Theatine spirituality that was familiar to her but also on medieval mystical literature.[50] Her contemplative excursus begins with the rational knowledge of God and ascends, through

the love of Christ, stage by stage to its final objective: the mystical experience of the contemplation of the Holy Trinity. In this context, rational knowledge is not considered valuable per se; rather, it acquires relevance by being framed in a Platonic-Augustinian search for a superior wisdom. In continuity with such texts as Scupoli's *Spiritual Combat,* Gaetana recognized a necessary cooperation—she used the term *conspiracy*—between intellect and sensibility. In concert with this tradition and with her Malebranchian inclinations, Gaetana described spiritual life as constituting the intellectual faculty (which contemplates) and the will (which loves). The way to the mystical marriage and the Christomorphic transformation of the soul ("transforming union," in the language of spiritual theology) requires the use of both faculties. Indeed, the soul is brought to the first mystical heaven by "the gifts of intellect and wisdom." But there is a stage when the intellect has fulfilled its function, and then it is "burning will" that continues to guide the soul to Christ: "Here, every human and angelic intellect surrenders in joy and amazement." Thus, according to Gaetana, mystical contemplation does not imply a negation of the power of the intellect but, rather, a realization of its inadequacy in taking the soul from "enlightening clarity" to "burning clarity," from cognition to love. There is cooperation rather than opposition between the two faculties: while "the human mind contemplates in marvel" the virtues of Christ, "the heart imitates them with love."[51]

The brief season of Catholic Enlightenment—the age of Muratori and Benedict XIV—saw the decline and marginalization of forms of visionary and contemplative mysticism and of the related model of sainthood, a process illustrated by the controversy over the writings of Maria de Agreda. Instead, sainthood based on moral and social virtues was consolidated and promoted. The Catholic Church had been disciplining mystical discourse and repressing contemplative movements such as quietism throughout the Counter Reformation. Individual visions and the excluding practice of passive contemplation were deemed dangerous because they escaped the control of the Church and questioned its social function. Benedict XIV would intervene directly to introduce new rules for canonization and new criteria for treating miracles and visions, essentially derived from a Muratorian perspective. This bureaucratization of sainthood aimed primarily to prevent improper social and political uses of the mystical discourse.[52]

Gaetana saw no contradiction between her intense social activity—inspired by the new model of lay sainthood—and her contemplative practice.

Indeed, her mystical text has much more to do with ascetic contemplative techniques than with baroque visions. Her mystical experience was grounded in the same distinction between levels of reality that she had defended against Gorini, and it was consistent with her beliefs about the relationship between intellect and faith. At a time when mystical visions were explained by enlightened Catholics as pathologies of the imagination, Gaetana, in her "Mystic Heaven," was exploring the possibility of nurturing the contemplative apprehension of religious mysteries within the boundaries of a "reasonable devotion."

CHAPTER FIVE

A List of Books

One morning in April 1752, following Pietro Agnesi's death, the notary Carlo Federico Tarchini entered Gaetana's studio and let his professional gaze survey the globes, armillary spheres, mathematical instruments, and volumes in the tall, finely carved walnut bookcases. At that point, Gaetana's working library was four hundred titles strong, similar in size to a college lecturer's personal library.[1] As with many other valuable possessions of the Agnesi, this collection was sold and dispersed in the following months. But Tarchini and his assistants recorded the title, or at least a part of it, of each volume, plus the format, and sometimes the place of publication—details that would be immediately significant for its pricing. Although not all titles and editions are identifiable with certainty, this inventory offers us a precious map of the cultural resources immediately available to Gaetana during the making of *Instituzioni analitiche*.[2]

The collection was probably built around a nucleus of books owned by the Agnesi-Mariani family, but the majority of the volumes were printed after 1700 and so can be directly related to Gaetana's studies and acquisitions. Not unlike their pictorial collection, the library of the Agnesi lacked historical profundity and prestigious items—in this case, the valuable sixteenth-century in-quarto editions that enriched patrician libraries. This is not to say that it lacked expensive volumes, for it did contain the lavishly illustrated *De astronomica specula domestica* by Giovanni Jacopo Marinoni (1745) and a Venetian edition of Noël-Antoine Pluche's *Spectacle de la nature* (1745–51), whose attempt to harmonize faith and reason from a Malebranchian perspective Gaetana must have particularly appreciated.[3]

The collection had taken shape during Gaetana's studies and reflected her intellectual inclinations. It contained the Latin and Greek texts that a

good college student should have read, such as Cicero's letters and orations and Virgil's poetry, plus a number of anthologies of classical texts and various dictionaries, lexicons, and grammars of Italian, Latin, Greek, French, German, and Hebrew. (Incidentally, the collection included books in these languages only, plus a couple of volumes in English. There is no evidence that Gaetana could read English, and she only referred to British authors in their Italian, Latin, or French translations.) Some of the Latin grammars had probably served previous generations of the Agnesi-Mariani family, as they were rather outdated and their style ran counter to the didactic tastes of Gaetana's tutors.

On the shelves with these teaching texts were numerous collections of speeches and orations for all kinds of social occasions (literary, political, military, religious), from the paradigmatic Ciceronian collections to contemporary authors and texts such as Italian translations of *The Gentleman Instructed* (1732), by the Jesuit William Darrell, and *The Travels of Cyrus* (1729), a pedagogical initiatory novel by the Scottish Catholic Andrew Michael Ramsay. The library also included an interesting section of *segretari,* manuals for writing letters, discourses, and poetry. The capacity to versify was invested with special social meaning, as it was common for learned gentlemen to compose poems to celebrate felicitous events, or to mourn dead acquaintances, or simply to be read in the conversazioni. There were also manuals of orthography, polite conversation, and good manners, from a recent edition of Giovanni della Casa's *Galateo,* to his many eighteenth-century epigones, as well as books with such titles as *How to Learn Latin Quickly* and *Quick and Easy Ways to Learn the History of Rome*.

That the Agnesi-Mariani, and Pietro in particular, were keen on self-improvement literature is not surprising. They were not alone: the success of this genre, in both periodical and book form, was an important factor in the printing boom that benefited Venice and other Italian cities during the first half of the eighteenth century. Meanwhile, in the weekly periodical *Gazzetta di Milano,* peripatetic private teachers with exotic names promised to teach Latin and French "with an easy and well-regulated method."[4]

The *Giornale de' letterati d'Italia,* published in Venice between 1710 and 1740, was emblematic of the new modes of the commodification and consumption of culture. Its thirty-nine leather-bound volumes, which must have figured prominently in the Agnesi library, are at the top of Tarchini's inventory. The *Giornale* was the most successful Italian periodical of its age

and important in the construction of an Italian cultural identity grounded on an idealized Renaissance heritage. The periodical aimed to represent the best in literary and scientific writing on the Italian peninsula while also appealing to a general audience of those interested in current Italian and European affairs.

What was distinctive about the *Giornale* was the programmatic support that it gave to economic, administrative, and religious reform in line with the positions of the Catholic Enlightenment. The editors, who had their main political interlocutors in Charles VI and his government, voiced current concerns about the "public happiness" of the Italian states. Most of the articles and reviews echoed Muratori's opinions and found a sympathetic reception within circles like Gaetana's. The periodical also defended the use of Italian in literature and promoted Muratorian good taste; in religious matters, it sustained Muratori's campaign for a "reasonable devotion" and fought the excesses of popular piety and its frequent shifts into superstition. The Jesuits' moral doctrines of probabilism and laxism were openly criticized, but so was the Jansenists' heretical stance on the question of grace and salvation. The Jesuits were also taken to task for their approach to theology and their methodological inclination to use scholastic logic to settle controversial points. These matters, the journalists maintained, should rather be assessed through a philologically sophisticated study of the scriptures and patristic literature.

In parallel with these battles, the periodical reported on the latest political events and their impact on Italian life. The disasters in northern Italy caused by the wars of Spanish and Polish succession prompted reflections on the need for new principles of government to prevent similar situations occurring in the future. The wealth of the Italian states should be reconstructed on new juridical, fiscal, and economic systems, which the journalists related to the advancement of the natural and mathematical sciences. It was precisely the belief that social reform could be fostered through modern science that explains the *Giornale*'s attempt to disseminate the best science produced on the peninsula.

Many of the Italian contributions to contemporary European scientific debates appeared on its pages, including the areas in which research tradition was stronger, such as infinitesimal calculus (Guido Grandi, Gabriele Manfredi, Jacopo Riccati), experimental physics (hydraulics, the origin of gravitational pull, the question of the live forces, and the experimental reports by Giovanni Poleni in support of the Leibnizian interpretation), the

history of the Earth (Antonio Vallisneri, one of the founders of the *Giornale*), the origins of fossils (the layer theory of Vallisneri and Ferdinando Marsili), botany (Giovanni Maria Lancisi, Marcello Malpighi), and human anatomy (Giovanni Battista Morgagni). Generally, the editors and contributors promoted a mechanistic approach to empirical reality based on the various local traditions that presented themselves as a direct continuation of the Galilean school. Phenomena were to be explained solely in terms of movements and particles, and any attempt to reconcile divine agency and mechanical philosophy by postulating a constant action of God in nature was resisted, as well exemplified in the debates on epigenesis and preformism.

The *Giornale* was an important resource for the scientific activity of Italian literati during a difficult political and economic period, particularly in those regions that, like Milan, lacked solid scientific institutions. It also expressed a pragmatic reform program in which cultural and scientific renewal was framed within a broader plan of social action. The direct, explicit connection between the urge for social reform and the production and diffusion of new knowledge and artifacts has often been described as a distinctive aspect of the Milanese Enlightenment proper—that is, the reform movement that took shape in the 1760s around figures such as Pietro Verri and Cesare Beccaria, the famed author of *On Crimes and Punishments*. However, as is clear from reading the *Giornale,* these features were already present in the earlier days of the Catholic Enlightenment.[5]

The order in which Tarchini inventoried the rest of the Agnesi books reveals a loose grouping by subject area, which probably reflects their original locations on the shelves. The school editions of ancient literature, poetry, and theater were blended with a good number of classics recommended by the defenders of *buon gusto*. These included editions of Homer, Pindarus, Euripides, Teocritus, Sophocles, Plautus, Virgil, Horatius, and Terentius, and nineteen volumes of the *Corpus omnium veterum poetarum latinorum,* published in Milan during the 1730s and 1740s. Works by contemporary playwrights were represented by Molière, Goldoni, and Gorini Corio. Remarkably, the library contained very few novels, although there was a French translation of *Robinson Crusoe,* and none of the many contemporary volumes explicitly targeted women.

The section on poetry, which was much richer, included the major works of poets ranging from Dante, Boccaccio, Petrarch, Ludovico Ariosto, Pietro Bembo, Jacopo Sannazaro, Torquato Tasso, Gabriello Chiabrera, and Giro-

lamo Fracastoro to Milton's *Paradise Lost*. The titles of then-recent poetic publications reveal that Gaetana's choice was guided by the Muratorian taste that also informed the Trasformati: unpretentious vernacular or dialectal poetry, sacred tragedies, and theatrical pieces with clear moral and religious underpinnings, such as those by Francesco de Lemene and Francesca Manzoni.

The rest of the collection was organized around three main thematic clusters: works of historical and religious erudition, theology (moral, dogmatic, and spiritual), and natural philosophy and mathematics. Ancient authors figured prominently in the historical section, with various editions of Sallustius, Caesar, Livy, Herodotus, Tacitus, Plutarch, and Pliny the Elder. The works of civil historians, particularly historians of Italy, were well represented; indeed, this was the field in which Muratori had first made his name during his Milanese years. The six-volume *Opera omnia* of the sixteenth-century historian and philologist Carlo Sigonio, edited by Muratori and published in Milan by the Società Palatina, a Muratori-inspired institution, between 1732 and 1737, was symbolic of his early cultural campaign. The library also housed a French edition of Newton's *Chronology of Ancient Kingdoms* (1728), as well as the historical and juridical works of Hugo Grotius, including *De jure belli ac pacis,* accompanied by a few other texts on the history and philosophy of jurisprudence, such as Samuel von Pufendorf's.

Gaetana's interest in current political affairs is signaled by the presence of numerous "political" and "historic-critical" dictionaries and by her having subscribed to multivolume series such as the seventeen-volume Italian edition of Thomas Salmon's *Modern History, or the Present State of All Nations,* published in Venice from 1731; a Venetian edition of Bruzen's *Le grand dictionaire géographique et critique* (10 vols.), published between 1737 and 1741; and other series in French and Italian, including a translation of Chambers' dictionary.

The works of civil historians such as Francesco Guicciardini and historians of religion such as Jacques-Benigne Bossuet seem to have been kept next to texts of Greek and Latin patristic literature, biblical exegesis, and modern theology. Histories of the Roman and Milanese Church and of the heretical movements, plus hagiographies and texts on dogmatic and moral theology, were particularly numerous and updated. Their authors included Francisco Suarez, Martino Bonacina, Agostino Orsi, Vincenzo Gotti, Angelo Maria Querini, Louis Habert, and Jean Leclerc. Texts of ascetic and spiritual practice ranged from medieval volumes to the works of Francesco di Sales

and Loyola's spiritual exercises, but the bulk fell within the Theatine ascetic tradition, from Scupoli to Giuseppe Maria Tomasi. Jesuit scholarship was present in the moral and controversialist section, with texts by Nicolas Caussin, Cesare Calino, Carl'Ambrogio Cattaneo, and Paolo Segneri. However, the theology section was centered on Muratori's moral philosophy and his texts on Christian charity, and such interesting additions as the essay on morals by Pierre Nicole, a sui generis Jansenist particularly appreciated by enlightened Catholics. There were also numerous technical texts, such as instructions for father confessors and polemical pamphlets relative to recent liturgical controversies, and collections of sermons and orations delivered by famed contemporary preachers.

Among the theology books, those that played a role in a series of controversies stirred up by enlightened Catholics stand out: the natural explanation of magic and the possibility of diabolic intervention in human affairs.

Following Muratori, and with the backing of Benedict XIV, enlightened Catholics claimed that contemporary phenomena of witchcraft and possession were almost invariably explicable in natural terms, most commonly by referring to pathologies of the imagination, particularly those of females. Most texts on this topic in Gaetana's library date between 1745 and 1751, and include those written by Girolamo Tartarotti, Scipione Maffei, Costantino Grimaldi, and Andrea Lugiato. It is probably its potential use in this debate that explains the presence of the Italian translation of Sir Thomas Browne's *Pseudodoxia epidemica, or Enquiries into Very Many Received Tenents and Commonly Presumed Truths* (1646), which, interestingly, was reprinted in Venice as late as 1737. Within the broader debate on the reality of the witches' Sabbath and diabolic magic, Gaetana collected with particular care texts relative to a minor but emblematic controversy: "the famous and agitated phenomenon of the young woman from Cremona." We shall look briefly at this case, which illustrates the richness of these debates and their multiple levels of significance.

In 1746, a thirty-three-year-old woman from Cremona, a city within the borders of the state of Milan, began discharging objects of remarkable dimensions through her orifices, as dutifully reported by the physician Paolo Valcarenghi in his *De saxis, acubus, ferries, vitreisque frustris, non exigua molis, variae superficiei et figurae, aliisque plurimis rebus, plerumque vomitum, aliquando etiam per inferiors partes ejectis*. Valcarenghi, a renowned professor of rational medicine at the University of Pavia, had been called immediately by

the bishop of Cremona to investigate and report on the nature of this phenomenon, which many in Cremona considered supernatural. Valcarenghi's elegantly written and bound Latin essay, dedicated to the Senate of Milan, was soon followed by other publications either criticizing or defending it—thus illustrating the conflicting theological and epistemological assumptions at work within contemporary Catholic culture.[6]

The woman's spiritual director, backed by some theologians of the Society of Jesus, declared her behavior to be the result of demonic possession and performed an exorcism on her. From their perspective, the objects had been produced in the woman's body in ways that were explainable in terms of scholastic physics and metaphysics. The demonic interpretation of similar phenomena was still popular in missionary and monastic orders such as the Jesuits and the Capuchins, which practiced exorcism routinely and defended a baroque devotion centered on frequent encounters with the supernatural.[7]

At the opposite end of the theological spectrum was the intervention of a canon from the cathedral of Cremona, Giovanni Cadonici. Cadonici was a well-known theologian appreciated by Benedict XIV, Muratori, and other leading figures of the Catholic Enlightenment for his moral rigor and his battle to promote a "purified" Augustinian theology as the original doctrine of the Church. He was a declared enemy of Jesuit theology and moral doctrines, and his contribution to the case of the young Cremonese woman should be understood in the context of his long-lasting theological struggle with the Society of Jesus. Cadonici framed the problem in juridical terms, claiming that the woman was faking her condition, that she was an impostor—thus also casting a shadow on her spiritual director, whom Cadonici did not regard as trustworthy. Cadonici certainly admitted the possibility of encountering real cases of either divine revelation or diabolic possession, but he insisted on a rigid interpretation of the pontiff's new criteria for establishing true sainthood and miracles—an epistemological stance closely related to his battle against probabilism in moral philosophy and to his denunciation of the ambiguous role of Jesuit confessors in creating cases of "false sainthood," another major topic of theological debate in those years.[8]

While in line with the reformed theology of the Catholic Enlightenment, Cadonici's position also contained archaic traits, such as his belief that the case should be framed solely in a theological perspective. This made him clash with those, like Valcarenghi, who were ready to offer a natural explanation for the woman's behavior, outside the juridical paradigm of false

sainthood. It should be noted that the theological and medical discourses did intersect and conflict at points, but they were structured around different debates. For the physicians, the case became primarily a testing-ground for their theories of imagination. Valcarenghi believed that the young woman's body and cognitive organs fell entirely within the jurisdiction of the natural philosopher, and he backed this assumption with references to the scriptures and to some of the same key texts of the Catholic Enlightenment used by Cadonici, such as Benedict XIV's text on the rules for canonization and Muratori's essay on the power of the imagination. While Cadonici was interested in their theological innovations, Valcarenghi used their epistemological stratification to legitimize his philosophical considerations. It is revealing that the Pavese professor is said to have felt that it would be improper for him to reply in person to Cadonici—"a priest who knows of medicine as much as an ox of playing music"—and he let one of his students counter-attack instead. An altogether different critique came from the physician Andrea Fromond, who suggested that the woman might be an impostor because he contested Valcarenghi's theory of imagination and cognition.[9]

In his essay, Valcarenghi treated the case by running through the categories elaborated in the lively experimental and mechanistic tradition of Vallisneri, Borelli, Morgagni, and Redi, producing a report that is a glaring example of the new attitude of enlightened Catholics toward the question of miracles and supernatural events. He diagnosed a hysterical disorder that had degenerated into a mania, probably originating from the sudden death of the woman's fiancé. The pain of this loss, Valcarenghi reasoned, was such that it had eventually damaged the woman's faculty of imagination, which he located in the meninx. As imagination is the necessary medium for knowledge of the external world, the intellect and will of the woman could no longer function properly. This also meant she could not be held responsible for her often indecent behavior. Where Cadonici saw a condemnable blend of sexual lust and calculated imposture, Valcarenghi recognized an altered mind and suggested possible ways of restoring its correct functioning. Throughout his book, the physician made clear that he did not exclude in principle the possibility of possession and the reality of diabolic forces, but he was inclined to consider their presence in everyday experience extremely remote, in line with the reinforced pontifical directives against religious enthusiasm and mystical visions.

The "rare phenomenon of the young Cremonese woman" became a mat-

ter of intense discussion at the Agnesi conversazione, so much so that one of its frequenters, the physician Carlo Gandini, decided to dedicate his assessment of the opinions of Valcarenghi, Cadonici, and Fromond to Gaetana. Gandini, who called himself a disciple of Antonio Vallisneri, was an unusual figure—a philosopher and physician who had traveled widely through northern and southern Europe. An outspoken critic of contemporary university teaching, he would later make his name as a champion of smallpox inoculation. His remoteness from Milanese patrician circles and his specializing in treating "convulsions" may explain how he came to benefit from Pietro's patronage, for which he expressed his gratitude in his pamphlet on the Cremonese woman. Here Gandini recognized that the possibility of imposture, like that of real possession, could not be ruled out, so he defended Cadonici from the virulent attacks of Valcarenghi's pupils. Then he focused on the debates about the existence of animal spirits and the functioning of the brain and the nervous system—that is, the background to the controversy between Valcarenghi and Fromond—illustrating its undecided aspects and arguing for the need to carry out more experimental investigation. The lengthy description here is the result of his own attempts to isolate and study animal spirits. These experiences certainly offered rich matter for conversation at the Palazzo Agnesi, based as they were on Gandini's distillation of hard-to-obtain human heads.[10]

The rest of Gaetana's library was made up of books of natural philosophy and mathematics. The first section included some texts of ancient philosophers and related commentaries. The landmarks of late scholastic philosophy were absent, although arguments in favor of Aristotle's physics could be found in a few works, such as Stefano Pace's *La fisica de' peripatetici, cartesiani ed atomisti al paragone della vera fisica d'Aristotele* (1729). Among the ancient authors are the texts of minor Pythagorean authors as well as Aristotle, Alexander of Aphrodisia, Xenophon, Pseudo-Longinus, Lucretius, Seneca, Diogenes Laertius, Boetius, and Philo Judaeus.

Descartes introduces the moderns, and indeed most of them are either Cartesians, such as Jacques Rohault or Etienne Chauvin, or thinkers who aimed to integrate traditional university teaching in philosophy with Cartesianism and the modern experimental sciences. This was the cultural horizon of works by Jean-Baptiste Duhamel, first secretary of the Academy of Sciences of Paris; the theologian Edmund Purchot, whom we have already met; the Sicilian physician Tommaso Campailla; and, most notably, Nicolas

Malebranche, present in the library with his *Recherche de la verité* and the *Méditations chretiennes et métaphysiques*. The Leibnizian tradition was also well represented, with Leibniz's *Principia philosophiae*—the 1721 Latin version of the *Monadologie*—and some works by Christian Wolff, including his *Elementa matheseos universae* (1713–15). Also worth noting is the *Institutioni di fisica,* by Emilie Breteuil du Châtelet, in a Venetian edition dated 1743. The philosophy section also included a few works by exponents of the more skeptical, fideistic, and antirationalist current within Catholic culture, such as Pierre-Daniel Huet's *Demonstratio evangelica,* which, against Descartes, emphasized the weakness of the human mind. At the same time, one could have found on the shelf *La Logique, ou l'art de penser,* by Antoine Arnauld and Pierre Nicole, and a French translation of John Locke's *Essay concerning Human Understanding*—all of which gives a sense of the broad spectrum of epistemological positions covered by the collection.

The selection of books of mathematics, natural philosophy, and experimental physics was rich, up to date, and reflective of recent Italian and European debates. Among the periodicals were the commentaries that the Academy of Sciences of Bologna had begun publishing in 1731 (*Commentarii de bononiensi scientiarum et artium Instituto atque Academia*); the *Mémoires de mathématique et de physique tires des registres de l'Académie Royale des Sciences,* printed in Amsterdam from 1738 (covering the years up to 1740); the *Acta* of the academy of science in St Petersburg, in a Latin edition printed in Bologna from 1740 (covering until 1733); a seven-volume collection of scientific articles that had appeared in the *Acta eruditorum* of Leipzig; and the Italian translation of the *Philosophical Transactions,* a landmark of Italian Newtonianism printed in Naples between 1729 and 1734. Next to them were Newton's *Principia mathematica* (the Geneva edition), his *Aritmetica universalis,* and a French edition of the *Opticks* dated 1722, all texts that Gaetana was studying in the 1730s.

There were also numerous texts promoting the accordance of Newtonian philosophy with religious orthodoxy, from the Catholic Nicola di Martino to the Anglican latitudinarians John Keill, Roger Cotes, David Gregory, George Cheyne, William Derham, and Henry Pemberton. Alongside the Newtonian physico-theology were the Dutch experimentalists, with Huygens's Latin works and those by Willem Jacob 's-Gravesande and Petrus van Musschenbroek. The many texts of experimental physics—among them, the paradigmatic text of the Galilean school, *Saggi di naturali esperienze* of the Accademia del Cimento—were accompanied by guides on the construc-

tion and use of astronomical and cosmographical instruments (Nicolas Bion, Giovanni Paolo Gallucci), some of which Gaetana had in her studio.

Gaetana collected copies of those philosophy textbooks that shared to some degree her epistemological preferences. This, as we have seen when dealing with the *Propositiones philosophicae,* consisted essentially of interpreting categories of the Aristotelian metaphysics as relative to psychological processes and epistemological conditions rather than to natural phenomena. These texts included those of the friar minor Fortunato da Brescia, the Piarist Edoardo Corsini, and the Somaschan Giovanni Crivelli. Early eighteenth-century Jesuit textbooks trying to reconcile scholastic philosophy and modern doctrines are significantly absent, including Tommaso Ceva's *Philosophia novo-antiqua,* a successful book that had been published in Milan and was representative of philosophical tendencies of the Brera college. The *Journal de Trévoux,* the main periodical for the diffusion of Jesuit culture, is also missing.[11]

Other, more technical texts from contemporary Italian natural philosophers included Eustachio Manfredi's astronomical works and the products of the mathematical and experimental tradition of the Venetian mainland, such as Poleni's *Institutionum philosophiae mechanicae experimentalis;* the famous anti-Newtonian essay on light and color by Giovanni Rizzetti; and the essay by Vincenzo Riccati on the question of the live forces. Antonio Vallisneri was probably the single best represented author in the library, with numerous volumes of his collected papers spanning human and animal generation to the origin of fossils, the nature of spring waters, and his own medical reports. Enlightened Catholics believed that Vallisneri's work might provide a framework for harmonizing religious orthodoxy with the modern natural sciences, including the potentially dangerous natural history of the Earth and the question of the origin of life. Many of the arguments that Gaetana defended in her domestic academies were indeed taken from his publications. Other books that probably provided resources for her public performances included Eusebio Sguario's *Dissertazione sopra le aurora boreali* and the reports of Jean-Antoine Nollet's electrical experiments—Gaetana owned the latter's *Leçons de physique expérimentale* (1743) and *Recherches sur les causes particulières des phénomenes électriques* (1749). She had corresponded with Nollet, who was well aware of her "remarkable advancements in the sciences" and who praised her knowledge to Bolognese academicians.[12]

Finally, the mathematical section was rich and current, but with a clear focus on what we would call pure mathematics. There were a few works in

the area of probability calculus, such as Jakob Bernoulli's *Ars conjectandi* and Moivre's *Doctrine of chance,* but books on mixed mathematics were almost completely absent, while we find numerous texts on arithmetic, algebra, and geometry, ranging from landmark seventeenth-century works by Christopher Clavius, Francesco Maria Figatelli, and André Tacquet to those of Philippe de la Hire and Girolamo Saccheri—whose theological texts Gaetana also collected. Her interest in honing her knowledge of the techniques of analytic geometry and calculus emerges clearly from the remaining books, written by Jacques Ozanam, Guillame François de l'Hospital, Charles Reynau, the Bernoullis, Pierre Varignon, and Jean-Pierre de Crousaz. The number of these texts, together with the presence of popularizations such as Fontelle's *Elements de la geometrie de l'infini,* reveals the distinctive objective that guided Gaetana's mathematical study during the 1740s: preparing an accessible introduction to analytical geometry and to the new and still rather esoteric subjects of integral and differential calculus.

CHAPTER SIX

Calculus for the Believer

The Olivetan monk Ramiro Rampinelli arrived in Milan at the end of 1740, having been dispatched to teach mathematics at the monastery of San Vittore in Corpo. Rampinelli was already a well-known teacher and one of the few credited with being able to lecture on the new analysis of Leibniz and Newton. Once in Milan, the monk soon came into contact with the Agnesi circle, probably through his fellow Olivetan Luigi Stampa, a frequenter of the Agnesi conversazione. These monks, like others in the Benedictine tradition, believed that the teaching of mathematics was essential to the education of ecclesiastics as well as the Catholic young. They were convinced not only that mathematics was necessary to philosophy but also that it had a positive, "fortifying" effect on the pupil's spirit.[1]

Rampinelli was born in 1697 into a notable and affluent family in Brescia, a city within the borders of the Venetian Republic but with strong cultural and economic connections to Milan. After completing a philosophy course at a Jesuit college, he began the study of law, in line with his family's expectations. However, his biographers tell us, he soon became bored with the subject and, in about 1718, began spending much of his time inspecting fortresses and studying the principles of their construction, including the imposing Brescia castle, where, to the amusement of his friends, he began wandering atop the bastions with a pair of compasses and a huge iron ruler hidden under his cloak. He eagerly read Euclid, the fifteenth-century editions of Greek geometry, and the recent French literature on fortifications. That was quite enough for his father who, still hoping for a law degree, destroyed his son's books and forbade him to pursue this line of study any further. In desperation, Rampinelli told his family and friends that he wanted to join the Venetian army.

This threat, and the mediation of local Jesuits, eventually forced Ram-

pinelli's father to agree to let him study geometry and algebra and their applications. This Rampinelli did, at first privately, then at the University of Bologna, where he spent three years studying with Gabriele Manfredi, the author of *De constructione equationum differentialium primi gradus* (1707) and one of the few Italian mathematicians competent in the new mathematical techniques of calculus. "Through calculus and analysis," a friend and biographer wrote, "a series of many sublime truths was revealed to him, as when the curtain is raised in a theatre."[2] This discovery was, for Rampinelli, a type of religious enlightenment, which eventually led him to decide to enter the cloister as a Benedictine monk of the Congregation of Monte Oliveto (1722). He took his vows at the monastery of San Michele in Bosco, which overlooks the city of Bologna. As was customary, his being reborn into a new life was marked by the abandonment of his previous given name, Ludovico, and the adoption of a new one, Ramiro.[3]

Rampinelli's life can be seen as yet another story of a difficult relationship between an ambitious father and a brilliant son who was irresistibly attracted to the mathematical sciences. Ludovico/Ramiro's conversion follows the traditional hagiographic pattern, according to which an exuberant young man who enjoys the company of friends and indulges in mundane pleasures suddenly retires from the world to lead a contemplative life. Indeed, Rampinelli became known for his self-control and concise discourse, apparently limiting himself to the use of "short and exact sentences."[4] What is interesting in this story is the importance attributed to the study of mathematics. Like Gaetana some years later, the young Rampinelli had become convinced that geometry was the science that could nourish religious piety most effectively. Hence he accompanied his theological study with continuous geometrical exercise.

Although now a monk, Rampinelli continued to study with Manfredi in Bologna, and he eventually embarked on a journey that took him to the other main centers for the study of calculus in Italy: the Venetian mainland and, to a lesser degree, Rome. By 1727, he had moved to a Venetian monastery, and in 1728 he was in Padua, where he could visit local practitioners such as Marquis Giovanni Poleni and Count Jacopo Riccati and his son Giordano, who hosted him for a few months at their palazzo in Castelfranco. In 1731, Rampinelli moved to Rome, where he remained for a year, frequently meeting with such ecclesiastics as Celestino Galiani and Antonio Leprotti, two key figures in the cultural and scientific life of the city. We have already encountered Galiani, who was promoting an apologetic version of the New-

tonian philosophy analogous to that supported by the latitudinarian church in England. Leprotti, who acted as the Roman referent of the Institute of Sciences of Bologna, was a skilled mediator between the cultural policy of the Curia and the experimental and mathematical practices of the Bolognese and Venetian groups. While in Rome, Rampinelli taught mathematics privately, one of his pupils being Giuseppe Orlandi, a Celestine monk and future bishop, whom we previously met as one of Gaetana's correspondents. He also visited Naples to meet Nicola de Martino, who taught Newton's natural philosophy at the local university. In 1733, Rampinelli was back in Bologna, teaching mathematics and mechanics to novices of his order. By January 1741, he had settled at the Milanese monastery of San Vittore, where he would teach for the next six years, until the Senate of Milan offered him the chair of mathematics at the University of Pavia. There he taught until 1758, acting also as engineering consultant for the local authorities on hydraulic matters.[5]

Rampinelli's case effectively illustrates the difficulty of studying a scientific culture in which most communication, original research, and innovative teaching took place by means of informal networks of correspondence and the circulation of manuscripts.[6] Rampinelli did not publish a single piece of work during his lifetime, yet he was perceived by his contemporaries as a key figure in his field and the one who had first brought the new methods of analysis to the state of Milan. In this light, reading his surviving lectures on optics (*Lectiones opticae*) and mechanics (*Institutiones mechanicarum*) is a rather disappointing experience, as they are essentially based on the synthetic methods of Euclidean geometry—not only in their language but also in their conceptual structure. Rampinelli used infinitesimal quantities and infinitesimal techniques, as in a lecture *de motus in curvis lineis,* but always in a fundamentally geometrical form. Dealing with the calculus of variations, he tackled the problem of the brachistochrone curve with synthetic methods and the theory of proportions rather than with calculus, not unlike Newton in the *Principia*. However, Rampinelli was clearly aware of the work of the Leibnizians on the same problem. At one point, he said that those who want to study motion not just in the abstract but through resistant media (*in medio resistente*) would need to familiarize themselves with a higher form of geometry (*non vulgarem sublimioris geometriae notam requirunt*), which could not be presented in such an elementary course. He was clearly referring to differential and integral calculus. His biographers agree, reporting that Rampinelli had taken a series of manuscript lectures

to Milan in which he had consistently applied the new calculus (*infinitorum calculus*) to the study of nature.[7]

The reception of calculus followed different patterns in different Italian states and institutions. Contrary to what might be expected, local Galilean traditions did not necessarily facilitate the reception of the new mathematical methods and their application to the study of natural phenomena. Instead, during the second half of the seventeenth century, those technically sophisticated institutions in which the Galilean traditions were entrenched put up significant resistance, first to analytic geometry and then to calculus. Particularly in Tuscany, leading mathematicians defended a characteristic form of geometrical purism.

While Galileans argued for the fruitful application of geometry to nature, they attributed a derivative and secondary role to the algebraic techniques and to calculus as well. The inferiority of analysis was at once epistemological and social. Algebra was indeed associated with practical engineering and the arts, while synthetic geometry in the style of the ancients towered over any other forms of human knowledge—apart from theology—for certainty, elegance, and metaphysical relevance. In about 1700, the teaching and research of mathematicians trained in the Galilean tradition was based on sophisticated developments of the synthetic methods. In this respect, their practice did not differ significantly from that of leading Jesuit mathematicians, such as Girolamo Saccheri, author of an ingenious attempt to demonstrate *per absurdum* Euclid's fifth postulate.[8] Reading Rampinelli's life more carefully, one realizes that what had enraged his father in 1718 had been his son's passion for algebra, a discipline that, in the common opinion of the educated, was still associated with the discredited practice of magic and astrology.[9]

This resistance to the techniques of calculus and their empirical application should not be understood as a consequence of cultural isolation, but rather as a deliberate choice of many practitioners who did not accept the new analysis as the privileged instrument for the investigation of phenomena and the discovery of new empirical truths. The reasons for this skepticism were deeply rooted in a certain interpretation of the Galilean image of knowledge and included considerations about the social status of the practitioners as well as the legitimate form of their cultural products. Significantly, Vincenzo Viviani, the last of Galileo's disciples, listed among the

shortcomings of the algebraic methods that they did not allow the same display of eloquence as the synthetic ones.[10]

Vivani's reaction, however, was not representative of the practice of pure and mixed mathematics as carried out in other cultural areas of the Italian peninsula. In fact, despite the geometrical purists' opposition, the infinitesimal methods of Leibniz and Newton were already being welcomed before 1700—in the name of Galileo's experimental method. The first Italian publication on the construction of differential equations appeared in 1703 and was authored by Guido Grandi, a Camaldolese monk who taught at the University of Pisa—and was also a correspondent of Clelia Borromeo.[11]

In the years that followed, these techniques were adopted primarily in the context of the most significant branch of mixed mathematics in north Italy, the so-called science of waters. It included problems and techniques from the rational and experimental mechanics of fluids, hydraulics, river hydraulics, and fluvial geomorphology. The discipline, which was rooted in Renaissance practical engineering, had been given geometrical form by Galileans such as Bendetto Castelli and by the 1690s had even entered some universities in the Po Valley. At the universities of Bologna and Padua, the science of waters became a privileged focus for new patterns of academic careers and professionalization, prompted by the interest of local authorities in controlling rivers, irrigation networks, and lagoons. In this context, practical engineers and Jesuit professors of mathematics were progressively marginalized in favor of lay academics who acted as consultants to local authorities and used the new mathematical language. The contrast was social and cognitive, as both the emphasis on the manipulation of algebraic symbols and the collapsing of disciplinary boundaries between mixed mathematics and natural sciences were opposed by representatives of the Jesuit experimental tradition. The socio-technical significance of the science of waters cannot be overemphasized. And, in the early 1700s, beginning with the War of the Spanish Succession, another layer of political meaning was added to this science with the emergence of a long-lasting controversy between representatives of the Papal States, Venice, and Austria over the management of the Po River and its delta.[12]

It was in this context that Leibnizian calculus began to be taught routinely in Bologna by Gabriele Manfredi and in Padua by Leibnizians from the Basle group, specifically invited by the local authorities. In the 1710s, this

training would enable practitioners Bernardino Zendrini and Giovanni Poleni to read Newton's *Principia* and publish papers on the resistance of river beds and other issues in the science of waters using Newton's methods and content. Correspondingly, most of the mathematical contributions that appeared in the *Giornale de' letterati* in those years were related to the science of waters. Only a few articles focused on pure mathematics, and these were written by figures outside the institutionalized patronage system, as a minor component of their overall scientific activity.[13]

Practitioners of the science of waters tackled their problems using a variety of resources, including Galilean mechanics, Jesuit experimentalism, and the mathematics of Leibniz, the Bernoullis, and Newton, while blurring the disciplinary boundaries between mixed mathematics and natural philosophy. Accordingly, they might side either with Newton or Leibniz, depending on the specific issue at stake. Debating whether these practitioners were Newtonians rather than Leibnizians cannot be anything but a frustrating task. Instead, we should understand their behavior in the light of their eminently practical concerns and their consideration of problems such as friction, where systematic experimentation seemed more effective than the use of hypotheses and generalization. Their metaphysical modesty, framed in Muratorian terms, contributed substantially to the making of the Catholic Enlightenment.

The state of Milan remained at the margins of these cultural and technical developments. Overall, Lombard society was less open to innovation and more linked to the forms of the ancien régime than those of its neighboring states. The patricians and the provincial landed aristocracy, who preserved much of their political and economic power, seemed content to perpetuate traditional agricultural systems. The members of these elites were, as we have seen, invariably educated at a handful of religious colleges whose curricula were designed to cultivate and reproduce traditional values.[14]

The teaching of pure and mixed mathematics was concentrated at the Jesuit college of Brera and at the University of Pavia, where the mathematics chair was held by Jesuit professors until mid-century. The science of waters and the socio-technical controversies associated with it were thus routinely treated by Jesuit mathematicians and lay technicians trained in their experimental tradition, such as Giovanni Ceva. There is no evidence that the new mathematical techniques of calculus were taught even privately in Lombardy before Rampinelli's arrival. Unlike on the eastern side of the Po Val-

ley, in Lombardy the science of waters had stimulated no interest whatsoever in calculus, its problems being treated rather through geometrical methods and well-tested experimental practice.[15]

It was only in the 1730s and 1740s, with the rise and consolidation of Muratorian reformism in Milanese society, that an interest in calculus emerged. Unlike in Bologna and Venice, however, the new experimental and mathematical sciences in Milan were supported primarily by reformist ecclesiastics. As we have seen, scholars from the Somaschan, Piarist, Barnabite, and Theatine orders and from the various families of the Benedictines were attentive to the cultural demands of diverse social groups. They did not perceive the scholastic system of knowledge as essential to the defense of religion; indeed, they believed that abandoning scholastic forms and language would contribute to the purification of the true faith by the removal of extraneous and historically determined elements. In this process, Jesuit institutions acted mainly as elements of resistance—hence the symbolic value of Rampinelli succeeding the Jesuit Brusati when he was offered Pavia's mathematics chair in 1747.[16]

However, not all groups of scholars in the Society of Jesus shared the same cultural perspective. The mathematicians, in particular, had long since been in a position to explore the technical aspects of various doctrines without committing themselves to their theoretical tenets. The published works of some Jesuit mathematicians during the first half of the eighteenth century reveal an ongoing epistemological shift, which differentiates them remarkably from theologians and controversialists in their order. If we go beyond the title pages of Jesuit treatises, we soon realize to what extent, by mid-century, the rigid ontological and epistemological demarcation between philosophy and mathematics had changed. Originally this demarcation separated the study of essences from that of phenomena: the first was reserved for the philosopher and should be carried out through the modalities of the scholastic apparatus and in agreement with Aristotelian physics and metaphysics; the second was essentially descriptive, could employ sophisticated mathematical tools, and because of its subordinate position, enjoyed relative autonomy.

Traditionally, these boundaries had prevented Jesuit mathematicians from legitimately entering those areas of experimental research that seemed to question important philosophical postulates, such as the research aiming to prove the existence of the void or the corpuscular structure of matter. However, texts from the late seventeenth century to the mid-eighteenth cen-

turies reveal a gradual erosion of the metaphysical apparatus to the advantage of the domain of physics and the new mathematical methods. Often the metaphysical section of a textbook is reduced to a short chapter in which certain logical and ontological categories are introduced. We have already encountered the same basic strategy: the reduction of metaphysics to a few structural categories and the expansion of the experimental section are features of Gaetana's *Propositiones philosophicae,* as well as of other textbooks authored by enlightened Catholics. After 1750, the Milanese Jesuit Giovanni Antonio Lecchi, professor at the college of Brera and technical consultant to the Senate on hydraulic matters, adopted a similar strategy in his textbooks on mathematics and physics. Remarkably, Lecchi openly recognized his debt to the work of the "the most distinguished and erudite Lady Agnesi."[17]

As we have seen, Gaetana had begun reading l'Hospital's analytic treatise on geometric curves in 1735, and for the next five years, she gathered materials with the intention of publishing a commentary that would clarify some obscure and incomplete passages in this book.[18] However, having secured Rampinelli's collaboration, she felt ready to embark on a more ambitious project: a unitary and systematic introduction to algebra, analytic geometry, and the new techniques of differential and integral calculus as they had been developed in the previous few decades.

Meanwhile, through Manara and Rampinelli, Gaetana was able to enroll a number of natural philosophers and mathematicians in her network of correspondents. In her papers, for example, we find letters to Giovanni Bianchi, or Janus Plancus, a well-known philosopher and physician from Rimini and professor of anatomy in Siena, dating between 1741 and 1744. Also notable is her reliance on the Theatine network for delivering copies of her *Propositiones* to the Venetian Republic.[19] To the same period dates a letter to Giovanni Crivelli, in Venice, which reveals that the Somaschan had asked her for a brief dissertation on the aurora borealis for the second edition of his successful physics textbook (1744). She complied, on condition that her name not be mentioned.[20]

Although responding to natural philosophers on matters that she had treated in the *Propositiones,* Gaetana was clearly focused on her planned mathematics textbook. Particularly relevant to its preparation was her correspondence with Count Jacopo Riccati (1676–1754), who had been working on advanced topics in differential and integral calculus since early in the century, and with his sons Vincenzo and Giordano. Rampinelli had intro-

duced Gaetana to his former teacher in June 1745, presenting her as someone instructed not only in physics, geometry, and mechanics but also "in the best metaphysics." "In a short time," Rampinelli continued, "thanks to an extraordinarily robust and profound talent, [she] came to master marvelously the Cartesian [analysis] and the two infinitesimal calculi." Rampinelli reported his awe in "seeing so much talent and deep knowledge in a woman, [as] it would be remarkable in a man," and this coupled with "very particular" Christian virtues. Gaetana contacted Jacopo in July 1745, asking him to verify the soundness of her systematization. She sent him parts of her work as she prepared them for publication, and they were returned with Riccati's annotations and suggestions.[21] The seventy-year-old count addressed the young woman as a peer, and opened each of his letters by giving her the title of countess, possibly following a misleading remark by Rampinelli. (Eventually Gaetana, with that mixture of humility and straightforwardness typical of her letters, asked him if he thought he was corresponding with a Venetian gentlewoman.)[22] Riccati's last comments arrived in Milan in the summer of 1748, just before the final sections of *Instituzioni analitiche* were printed. Pietro, whose desire for a prestigious publication was no secret, had arranged with the publisher, Richini, to install a printing press on the ground floor of his palazzo. This meant that Gaetana could supervise the typographers, who had never before worked with the symbols of differential and integral calculus.

In her letters to Riccati, Gaetana did not evince much interest in his specialist research in mixed mathematics; rather, she was concerned with his elaboration of the techniques of differentiation and integration. Thus, for example, she asked his permission to include in her book a new method devised by him some years earlier to facilitate the differentiation of polynomial equations.[23] For earlier Italian examples of texts with similar didactic aims, Gaetana could look to only a few outdated works, such as those by Guido Grandi and Gabriele Manfredi, which were devoted to the integration of differential equations and were the only introductions to the infinitesimal techniques so far printed in Italy. In addition, Gaetana studied with care the more systematic textbooks produced by the Malebranchian group in France, particularly those by l'Hospital (1696) and by Charles Reyneau (1708). Although more general in their scope, these texts had also been made out of date by recent developments in the field.[24]

Gaetana's reading, her selection of materials, and her defining of an appropriate style and terminology were guided by her didactic goals. As we

have seen, she attributed great relevance to mathematics in the context of a truly Christian upbringing. The truths of geometry were exemplary in their certainty and, more specifically, they assumed a crucial metaphysical significance in the framework of a Malebranchian theory of knowledge of the sort she embraced. Her main challenge was to present calculus, the most advanced branch of the mathematical sciences, a discipline with few practitioners and no complete textbooks, to the young student. Gaetana noted that, although learning mathematical analysis was a "clear necessity," there were few teachers able to introduce students to its techniques; moreover, the relevant materials were spread "here and there in the books of various authors, and particularly in the *Acta* of Leipzig, the *Memoirs* of the Academy of Paris, and in many other journals." Gaetana decided to systematize these materials (*ridurre a metodo*), eliminating what was "superfluous" and proceeding "with that natural order, which perhaps provides the best instruction and the greatest light." She chose to write in the vernacular rather than in Latin, although the latter, she noted, "is believed by some to be more appropriate to these matters."[25] The style in which she provided the first systematic presentation of Italian terminology for the concepts of calculus was recognized by contemporaries as clear and straightforward.[26] Her didactic goal and her teaching experience account for some of the original features of the book, such as the unusual care she took in explaining every single step of mathematical reasoning and her continuous effort to clarify mathematical concepts through examples from everyday life (e.g., she introduced negative and positive numbers through the analogy of debits and credits).

Another interesting feature of the text has to do with the choice of the contents. Again, this should be understood with reference to Gaetana's specific purposes and priorities. She aimed to present modern analytical methods within the traditional framework of religious knowledge in order to enrich, not undermine, it, and she needed a strategy to advance that purpose. We have already noted how devout scholars such as Manara or Rampinelli dealt with experimental physics and mixed mathematics. Unlike her tutors, Gaetana decided to concentrate on pure mathematics, which, in its essentially geometrical form, already occupied a central position in the traditional system of knowledge. The way she did this was by showing how the most recent developments of calculus could be understood in purely geometrical terms. Her text thus created a new area between the existing textbooks, which remained well within the framework of the Euclidean synthetic methods, and the research activity of a restricted group of specialists who had no

interest in publishing introductory books or systematizing their work on calculus. Instead, in her first volume, Gaetana provided a well-ordered presentation of the principles and methods of the theory of algebraic equations and of Cartesian geometry, followed in her second volume by an introduction to differential calculus, integral calculus, and the integration of differential equations, which, referring to its historical origins, she called "the inverse method of tangents." Gaetana presented the contents of the second volume as a "natural" continuation of the geometrical methods expounded in the first. Her attitude is well illustrated by her attention to defining the notion of infinitesimal magnitude. She grounded it on geometrical intuition in a manner that was still considered "very satisfactory" by Sylvestre Lacroix at the end of the century. Gaetana's definition, which can be interestingly contrasted with Euler's, is thus emblematic of her work on clarification, her ontological concerns, and her departure from contemporary developments within the Leibnizian tradition.[27]

Major changes were taking place in the practice of calculus when Gaetana wrote her book. Until the 1730s, despite the well-known controversy between the Leibnizian and the Newtonian schools, translating mathematical works from the fluxional notation into the differential notation was common practice and presented no particular problems. To be sure, those working in the Leibnizian framework were more interested in the algorithmic dimension of calculus and its potential applications to a number of different fields, while the Newtonians emphasized the possibility of moving back to the geometrical meaning of their practice. From around 1730, the two approaches began to diverge radically, with the result that communication between the schools became more and more difficult. In strongholds of the Leibnizian tradition such as Basel and Padua, the algebraic algorithm of calculus developed rapidly in strict relation to specific applied concerns, mainly in dynamics, mechanics, and hydraulics. In Britain, on the other hand, the main concerns remained the geometrical meaning of calculus and its application to celestial mechanics. As a result, during the eighteenth century the translation of Continental works into fluxional notation became increasingly difficult. Following the examples of Euler and, later, Lagrange, and moving toward its progressive degeometrization, Continental mathematicians had completely transformed the practice of calculus by the end of the century. Characteristic features of Continental calculus were redefining the concept of "function" to include multivariate functions and partial de-

rivatives and assigning the central role of the application of differential partial equations to the mathematization of mechanics.[28]

The most prominent features of Gaetana's textbook arose from her decision not to follow this Continental approach. First, as her textbook was based on an essentially geometrical conception of algebra and calculus, she placed great emphasis on such techniques as the geometrical construction of equations and on such themes as the geometrical meaning of infinitesimals. Gaetana devoted considerable attention to the methods and goals of Cartesian geometry, though this was perceived by many as rather old-fashioned. When she moved to the analysis of infinite quantities, she acknowledged the relevance of recent papers by Riccati, the Bernoullis, and Euler. Still, she continued to keep the analytical formalism detached from mechanical and empirical considerations, in order to preserve the same simplicity, rigor, and evidentness that she held to be distinctive of the classical tradition in geometry. Significantly, the historian of mathematics Jean Etienne de Montucla included Gaetana's *Instituzioni analitiche,* "an excellent piece of work," in the tradition of Cartesian analysis, noting that it shared the Cartesian geometrical spirit.[29]

Second, even though leading Italian and foreign mathematicians were pursuing their studies on calculus in order to investigate its application to rational mechanics and experimental physics, not one example of the application of analytic methods to empirical problems can be found in the thousand pages of the *Instituzioni analitiche*. Gaetana considered the fundamental concepts and methods of algebra and calculus important primarily for their application to the solution of geometrical problems and to the study of interesting curves. One such curve, the *versiera,* the curve that is commonly associated with Gaetana's name. In presenting the techniques of Cartesian analysis, Gaetana studied the equation of this and other curves to determine the simplest laws for their generation. The *versiera* had attracted little attention in previous treatises precisely because it could not be associated with any relevant mechanical or physical situation. Its interest lay exclusively in its remarkable metric properties.

It should be noted that this curve is known in Anglo-Saxon literature as the "witch of Agnesi." The word *witch* appeared in the English translation of Gaetana's book (1801), where one reads that, in Italian, this curve "is vulgarly called the Witch." In reality, in 1718 Guido Grandi had coined the name for this curve, *versiera,* from the Latin *versare* (to turn), a clear reference to its construction. In his translation, the Lucasian professor of math-

ematics John Colson rendered *versiera* as *witch,* interestingly confusing it with *avversiera* (she-devil).[30]

Historians of science have recognized the unusual features of Gaetana's approach to the analysis. Clifford Truesdell, for instance, was particularly puzzled because, "while learning calculus, she does not wish to study rational mechanics as well!" He also pointed to an interesting passage in a letter that she wrote to Jacopo Riccati. In response to his advice that she include in her text the study of some curves relevant to mechanical problems, she replied: "As for the squaring of the various curves mentioned by Your Excellency, I actually hadn't thought about many of them. However, the ones that depend on the knowledge of physics I left aside on purpose for, as Your Excellency has seen, I did not want to get involved with physical matters. I left aside all those problems that depend upon them, in order to avoid going beyond pure analysis, and its applications to geometry."[31]

These distinctive features should be understood as deliberate choices that Gaetana made, rather than as consequences of inadequate information or understanding. She believed that mathematics was the only field in which the human intellect could reach certainty; certainty derived from evidentness; and evidentness could be found in the intellectual perception of geometrical truths, not in the manipulation of algebraic algorithms. Her explicit reference to Charles Reyneau as her most important precursor is significant in this respect. Reyneau is not one of the great names in the early history of calculus, and modern commentators have found this reference rather odd. "If we may judge by the opinions other mathematicians held of that book," Truesdell wrote, "in addition to her usual determination and industry she must have had a strong stomach." Most of those "other mathematicians" and historians have been rather dismissive of Reyneau's textbooks. Montucla, in his a posteriori reconstruction of the pioneering age of calculus, noted that "although quite good at its own time, [Reyneau's writing] was far too prolix"; furthermore, the examples he provided were "abstract, and without any application."[32]

Given her metaphysical concerns and her geometrical approach to calculus, it is not surprising that Gaetana looked with interest at the mathematical textbooks of the French Oratorian tradition. Reyneau had been working, like l'Hospital and Guisnée, with the group of Oratorian mathematicians who had gathered around Malebranche in the last two decades of the seventeenth century. At first, they had defended Cartesian analysis; then

they brought the discussion about the new analysis of Leibniz and the Bernoullis to France. They were the first in that country to study differential and integral calculus, and the first to read Newton's *Principia mathematica* with care.[33] Malebranche himself asked Reyneau to complete an introduction to Cartesian algebra and to the new calculus; the resulting works were *Analyse démontrée* (1708) and *La science des grandeurs en general* (1714), both addressed to the students of the College of the Oratory.[34] The main goal was to present a complete introduction to Cartesian analysis and to explain the new infinitesimal techniques in terms of it.

In Reyneau's treatment, the theory of proportion was the unifying link between old and new elements, and the basic assumption was that geometry and algebra were different languages that described the same objects: relations between magnitudes. The didactic relevance of mathematics was due to its certainty (deriving from the clarity and distinctions of such ideas as number, extension, and magnitude) and to the heuristic value of the (Cartesian) analytic method, which "invariably takes us to the truth." Moreover, in the framework of the Malebranchian theory of knowledge, the practice of mathematics qua resolution of problems concerning magnitudes was invested with crucial metaphysical meaning. Malebranche defined truth as "nothing other than a real ratio, either of equality or of inequality." Truth, therefore, consists only in mathematical relations, and true knowledge consists only in the intellectual perception of exact quantitative relations between magnitudes. In this epistemological-theological perspective, the intellectual and spiritual faculty of reason is a divine gift to be nurtured, and the perfect truths of reason must be protected from the material contamination of the senses and the imagination—a theme that Gaetana found particularly congenial. Moreover, according to Malebranche and his theory of the vision of all things in God, the eternal truths relative to the abstract features of geometrical extension were constitutive of the intelligibility of material objects and derived directly from the communion between the individual soul and God.

Building on Malebranche's image of the metaphysical and epistemological superiority of mathematics over the other sciences, Reyneau emphasized that the study of mathematics perfects the spirit of the believer because it refines a fundamental "spiritual quality": the "capacity of attention."[35] The "mind's attention," in this Malebranchian context, was a key concept that unified intellectual activity and religious meditation, being defined as both a "natural prayer" and the "occasional cause" of our knowledge.[36] Conse-

quently, although Reyneau recognized the utility of mathematics in applications such as ballistics and fortification, he devoted himself mainly to the "other part" of mathematics, the one "abstract, and far from the senses," which contains "nothing other than speculative truths."[37] Malebranche's philosophical work and Reyneau's approach to calculus were treated with contempt by the philosophes because they aimed to integrate traditional metaphysical assumptions into modern science. The same features made Oratorian mathematics and didactics extremely attractive to Gaetana.[38]

In her presentation of calculus, Gaetana elaborated materials and styles from the northern Italian Leibnizian tradition but emphasized themes that were becoming extraneous to it. Furthermore, although she adopted differential notation, she declared that the "differential" was, in fact, equivalent to the Newtonian "fluxion." She also insisted on the priority of geometrical evidence and ignored the mechanical and hydraulic applications that were crucial to most contemporary practitioners.[39]

The unusual position of Gaetana's textbook in Continental mathematics is confirmed by the circumstances of its English translation in 1801, the one containing the notorious reference to the "Witch." Its publication took place in the context of the British debate on the nature of algebra and the foundations of calculus. The promoters of the translation, the polymath Francis Maseres and the clergyman John Hellins, saw the book as a valuable introduction to algebra and calculus in the Newtonian—"geometrical"—tradition. In fact, in the 1801 edition, Gaetana's original differential notation was translated into fluxional notation. Far from signaling the penetration of recent Continental analysis into the British Isles, this Italian textbook was presented in opposition to those late eighteenth-century British authors who criticized fluxional calculus. To get a sense of the violent tones of this debate, it may be useful to report Hellins's description of the British critics of fluxional calculus as "a cabal of sciolists, who endeavour to force themselves into the public notice by the misrepresentation and abuse of the most eminent authors." Instead, referring to Gaetana's work, Hellins wrote, "algebra is judiciously applied to the higher geometry, which renders it an excellent introduction to the doctrine of fluxions."[40]

In 1748, Lombardy emerged, ravaged, from decades of war and political struggle. Economic crisis and social tensions had deepened dramatically. While Senator Gabriele Verri gave voice to the ancient aristocracy and denounced the decadence of the Duchy of Milan and its inability to defend its

traditions and political autonomy, repressive new laws were promulgated in response to increasing criminality. Browsing through the pages of the *Gazzetta di Milano* at the Biblioteca Ambrosiana, one can notice the increased frequency with which members of the Confraternity of San Giovanni were called to assist those condemned to death, mostly thieves, street robbers, and members of outlaw bands operating on the outskirts of the city. Most of them were dragged by a horse (*a coda di cavallo*) "to the usual place"—that is, the common behind the basilica of San Lorenzo—and there executed by hanging. Their crimes, which authorities invariably attributed to an "otiose life," ranged from stealing cheese to homicide, armed robbery being by far the most common offence. The situation was such that, in June 1749, the Austrian governor, Count Harrach, ordered thieves and robbers to be hanged on the spot, bypassing the normal judicial procedure. The sides of roads were cleared of all trees and scoured by special posses, which included mounted soldiers, a priest, a notary, and a hangman. The corpses of criminals were to be left hanging, to be seen by everyone as a deterrent.[41]

Approaching the conclusion of her mathematical work, Gaetana began to renegotiate the agreement with her father. In fact, the very issue of the *Gazzetta di Milano* that reported the organizing of the antirobbery posses also announced to the Milanese public that the "much-expected work" of their fellow-citizen Maria Gaetana Agnesi had finally appeared and could be bought at the bookshop of Giuseppe Cairoli.[42] At that point, Gaetana felt that her complete commitment to social activity should not be delayed any longer.

Before publishing her textbook, Gaetana had already been invited to join a number of academies in Italy, including the prestigious Academy of Sciences of Bologna, which had elected her a member in June 1748.[43] Now, at the end of that year, with copies of her two-volume textbook beginning to circulate in Europe, she became famous. Throughout 1749 and 1750, she received numerous letters of congratulations. Expectably, most of these came from the Po Valley, and particularly from Bologna, Padua, and Venice. The secretary of the Academy of Sciences of Bologna exulted: "What neatness! What concision! What order! What clarity!" particularly appreciating her choosing to write in the vernacular.[44] Laura Bassi wrote to hail a book that "honors our sex in a special manner" and to confirm her appreciation for Gaetana's talent, which she had known "for many years." Interestingly, like other Bolognese academicians, Bassi also sent greetings to Pietro, whom she seems to have known well. In a similar letter, Jacopo Bartolomeo

Beccari, *anatomicus emeritus* at the University of Bologna, mentioned a visit that Pietro had made to his city and claimed that "the entire literary world owes him for the education of his daughters."[45]

Greetings arrived from the brother of the Venetian doge, who planned to use the book for the education of his children, and from the Theatine community in Venice. These priests, the still-active Father Tolotta, the dedicatee of Gaetana's *Oratio* (1727), among them, had been acting for years as the efficient distributors of her works. They read the *Instituzioni* "with eagerness and admiration."[46] In southern Italy, the Celestines were similarly mobilized for the diffusion of Gaetana's works. Brancone, now bishop of Gallipoli but still very fond of the Agnesi conversazione, acted as her mediator there, distributing copies he received through the Rome-based Procuratore Generale of his order.[47] Ecclesiastics were also crucial for the distribution of copies for review to the editors of Italian journals and the correspondents of foreign ones.[48]

Some letters of congratulations reveal relationships not otherwise documented, thus suggesting that much of Gaetana's correspondence must have not survived. One such case is a letter that reveals her familiarity with Bonaventura Luchi, friar minor and professor of metaphysics at Padua, who eulogized the book and promised to visit the Agnesi palazzo again in the near future. Luchi had no particular competence in mathematics, but he was a well-known theologian who had become notorious during the academic year 1738/39, when he gave an unprecedented university course on the philosophy of Baruch Spinoza.[49] We know nothing else about his curious association with Gaetana. Another Paduan professor, Giovanni Poleni, who sat on the chair that had been Jakob Hermann's and Nicholas Bernoulli's, praised the clarity of Gaetana's exposition and concluded that she had provided the most convincing argument for those who claim that "the *bel sesso* is provided with a capacity for the sciences which is equal to that of men."[50]

Congratulations arrived also from the Court in Vienna, while the plenipotentiary minister of Lombardy, Gian Luca Pallavicini, sent her, on behalf of the Empress Maria Theresa, a tangible sign of gratitude: a crystal box studded with gems and containing a diamond ring.[51] Fredrick Christian, who had met Gaetana back in 1739, wrote from Dresden, and his wife, Marie-Antoine, a passionate musician, took the occasion to thank Gaetana's sister Maria Teresa for the arias she had recently sent.[52]

Gaetana had distributed copies of her book in Paris and London mainly

through the well-tested network of the Academy of Bologna. From Paris, de Fouchy, the secretary of the Académie Royale des Sciences, forwarded to her the very favorable report on the book prepared by Jean-Jacques d'Ortous de Mairan and Etienne de Montigny on behalf of the academy. Montigny declared himself to have been aware of Gaetana's talent since 1740, thanks to his contacts with the Bolognese, particularly Zanotti and Bassi. Recognizing that hers was "the most clear, methodical, and complete" presentation of calculus published to date, he praised particularly its unprecedented methodological uniformity.[53] But Gaetana did not rely only on such academic channels; letters from members of the Parisian aristocracy reveal that her book was being promoted by well-connected patrician ladies from Milan, such as the Contessa di Belgioioso.[54]

Finally, significant recognition arrived from Rome, with a letter from the friar minor François Jacquier, a protégé of Benedict XIV who was professor of physics at La Sapienza University and coauthor of the annotated edition of the *Principia* (Geneva, 1739–42), which had legitimized Newton's natural philosophy within official Catholic culture. Jacquier praised Gaetana for providing integral and differential calculus with solid geometric foundations.[55] The pontiff himself wrote a personal letter of congratulations to Gaetana that showed some knowledge of the contents of her book and referred to his own studies of "analysis" as a young man. In September 1750, he wrote again, this time to announce that he had recommended Gaetana's appointment as lecturer in mathematics to the University of Bologna; she was duly proclaimed *lectrice honoraria* by the academic senate on 5 October 1750, in the presence of the papal *legato*. Bolognese professors had already informed Gaetana of the nomination in July; their correspondence indicates that she had never submitted any request for the post and that she was surprised by the offer. Although it might be thought that a mysterious trip Pietro made to Bologna in the mid-1740s prepared the way for this nomination, the original decision clearly came from the pontiff himself.[56] Through his patronage, Benedict XIV was trying to consolidate the cultural hegemony of enlightened Catholicism while also granting Bologna—his home city—the honor of hosting two of the most learned Italian women, Bassi and Agnesi, thus reinforcing the image of this Church-controlled university as a unique center of learning.[57]

Gaetana's fame was not spreading in academic circles alone. We also find references to her in, for instance, *Il medico olandese* [The Dutch Physician],

a comedy by the immensely popular Venetian Carlo Goldoni, first presented in Milan in 1756. In the opening scene, Monsieur Guden, a "hypochondriac Pole," is waiting in the studio of a renowned physician. Carolina, a servant, enters the room, searching the shelves for a book. She explains to Guden that her young mistress, the niece of the physician, would like to read a book of analysis recently printed in Milan. Guden is surprised. "Do you find it surprising that my lady inclines to the sweet study of geometry?" asks Carolina. "You should rather marvel at the fact that a woman has given such a great book to the world. She is Italian, my lord, not Dutch, she is an illustrious and wise lady, who brings honor to her country." Guden—more and more concerned—wonders what sort of woman the lady of such a servant can be.[58]

Let Monsieur Guden's surprise take us straight to the heart of our final chapter: How could a woman have established herself as a credible author of a book of calculus?

CHAPTER SEVEN

A New Female Mind

In February 1752, the governor of Milan and captain general of Lombardy, Count Gianluca Pallavicini, was invited to attend a soirée at the Palazzo Agnesi. The governor, a convinced supporter of Maria Theresa's administrative reform, was "very attached" to the Agnesi, and on confidential terms with Pietro. That night Pallavicini enjoyed the usual blending of Gaetana's conversation and Teresa's cantatas. The following morning, Pietro, as was customary, went to the Palazzo Regio-Ducale to thank the governor for his attendance. To his surprise, he found Pallavicini less than enthusiastic about the way in which the Agnesi conversazione was being run. The governor told him that unpleasant rumors had been circulating in the city recently, accusing Pietro of neglecting his daughters' *collocamento*—literally, their position in society—for the sake of his own social standing. In other words, he was being held responsible for preventing the two women from either getting married or entering the cloister and thus acquiring a decorous social status. Such an opinion could only have been strengthened by Pietro's recent rejection of a marriage proposal for Teresa. The suitor, one Pietro Antonio Pinottini, was apparently an "excellent" young man but had been "provided with a mediocre fortune." That the governor should pay attention to these criticisms offended Pietro deeply, and he responded using "words that, with hindsight, were less than respectful for the dignity of the great minister." The discussion degenerated rapidly into a "clamorous quarrel," and Pietro abruptly left the palace, greatly altered. In the following days, according to the physicians, the confusion in his mind made "his physical constitution change as well." He suffered "a violent chest pain" and, within two weeks, on 19 March 1752, he died.[1]

Negative judgments about the way in which Pietro managed his household must have been shared by a significant portion of the Milanese elites

if the governor himself felt obliged to remind him of his paternal duties. The main criticism raised against Pietro was that he kept his daughters in a peculiar social limbo, in which Teresa could be a full-time composer and Gaetana a legitimate philosopher and mathematician. There is no evidence that similar concerns had ever been raised in previous years. Instead, there are plenty of indications that, in the mid-eighteenth century, a significant shift in beliefs about women's social status and intellectual abilities was taking place within Italian culture.

The unusually active role of women in early eighteenth-century Milanese society had been noted—and often lamented—by contemporaries. Thus, in his discourse on the conditions of the Milanese state in the 1720s, Giuseppe Bini complained about the despotic power (*imperio*) of aristocratic women, which he believed was having dire consequences on the social and moral order. There is no country, he concluded, "where men, and particularly husbands and ministers, are more dominated by women than this one." Similar opinions were gathered in a report written at the time of the French occupation of the city (1736), entitled *Mémoires sur le milanois*. The anonymous author voiced current concerns about "the great credit enjoyed by the [female] sex," and the fact that women's "bizarre will" was more respected in this city than the "lumières de la Raison."[2]

The twin motifs of women's excessive power and moral degeneration enjoyed enormous popularity in eighteenth-century Italy, as illustrated by the vast amount of misogynist literature.[3] Devout Catholic authors found their main sources in works such as those by the Jesuit Paolo Segneri, who focused on the spiritual and social danger of women and said that a strict regime of segregation was the only way to neutralize them.[4] In this literature, the celebration of *ritiratezza* (or *fuga mundi,* flight from the world) and chastity as supreme feminine virtues was normally associated with moralistic criticism of phenomena such as the conversazioni and the *cicisbeismo*. The term *cicisbeo,* or *cavalier servente,* refers to a man who keeps company with a married woman and whose presence is benevolently tolerated by her husband. Critics portrayed this custom as yet another manifestation of women's excessive power, and one particularly apt to increase the grave moral decadence of the Italian aristocracy. Interestingly, *cicisbeismo* was strictly connected by its critics to the world of the conversazione, and indeed was often referred to as *conversazione moderna*—that is, the modern way of conversing.[5] The aberrant nature of *cicisbeismo* sprang from its inversion of

the power relationship between genders and thus in the weak, passive, and ultimately feminine social role played by the *cicisbeo*.

The constant associations between conversazioni, learned women, *cicisbeismo,* women's excessive power, and moral corruption were far from casual. In fact, the virulent satires against the *cicisbei* and their abdication of their natural rights can be interpreted as one aspect of a broader critique against women's education and the status of learned women. The conversazione was an important place of female acculturation, and the *cicisbei*'s "stupid subjugation to women" was often used to symbolize the unnatural attitude of private teachers.[6] Hence the recurrent presence, in contemporary misogynist literature, of books by Newton, Locke, and Leibniz in the toilettes of tyrannical and morally degenerate women.[7] The obvious suggestion was that the study of philosophy nurtured their moral corruption, which was symbolized in their relations with the *cicisbei*. But what was primarily considered ridiculous, dangerous, immoral, and degenerate was women's access to the higher forms of knowledge.[8]

The social institution of *cicisbeismo* was not unique or as peculiar as it was claimed by its contemporary critics and some later historians.[9] The success of the misogynist literature in chastising female haughtiness and the immorality of *cicisbeismo* should rather be understood as a reaction to the truly exceptional and well-documented presence of learned women in Italian conversazioni, academies, and universities, with a particular concentration in the area covering Milan, Bologna, and Venice. The long-lasting debate on women's education, morality, and "abuses" was therefore nurtured, in the eighteenth century, by the scandal of the *filosofesse* and the perception of their ambiguous social status.[10]

The criticism of *cicisbeismo* and learned women enjoyed a long-lasting and almost universal success during the second half of the century, as they both became targets of the enlightened critiques of those Italian authors who sided with French philosophes and the encyclopedia movement. In their writings, the fatuous *cicisbeo* is a symbol of the moral degeneration of the ancien régime and of its aberrant social mores, not unlike the cunning Jesuit priest and, indeed, the haughty woman philosopher. Overall, the misogynist literature on women's power and education produced by devout Catholics was not challenged by enlightened reformers; rather, traditional arguments based on the moral and social disruption that would follow from women's education were replaced by philosophical arguments based on the inadequate physical structure of the female body and mind. As has been of-

ten noted, during the second half of the century, the debate on women's education shifted progressively toward physiology. On the Italian peninsula, between the publication of Antonio Conti's letter on the physical makeup of the female mind (1756) and the controversies on the "thinking uterus" in the 1770s, a new image of the woman's mind had thus emerged and stabilized.

Antonio Conti was a Venetian polymath who could boast personal acquaintance with the likes of Newton, Malebranche, and Leibniz. In a letter originally written in 1721, he clearly expressed his opinion about the question of whether women's intellectual faculties were inferior to men's. He believed that the question should not be tackled through abstract principles but through the light (*lumi*) of reason and should be based on recent results of experimental philosophy.

Woman's body, so his argument goes, is less vigorous than man's. Physical vigor depends ultimately on the "consistency" and "elasticity" of the fibers that constitute the organism. Because of its reproductive function, the female body is richer in fluids and, as a consequence, its fibers contain more liquid, which makes them less elastic and solid. Conti supported his argument with references to experience and microscopic observation. Anatomy further confirmed that there are important differences in the constitution of the female body, such as a greater diameter of the aorta and thus lower blood pressure, which in turn determines a lesser velocity in the circulation of the "nervous juice" through the nerves. The less-developed muscles in the female body have a visible effect on the slower circulation of both blood and nervous fluid. Anatomy had proved less useful for inspecting the brain, Conti complained, so his arguments had to be based on behavioral observation. He relied on traditional stories illustrating the effects of imagination on the female mind and sometimes on the bodies of their children. These facts suggested that female cerebral fibers are "softer" and thus easier to "impress."

After having inspected and compared a number of organs, and invariably concluding that the female body and its constituents have a softer, more delicate structure, Conti moved on to consider the issue of "spiritual vigor." His key assumption was that the soul is located in the brain and that "the purest ideas of the intellect are always accompanied by some movement of the brain." More precisely, he associated the vibration of the tiny extremities of the nervous filaments with intellectual activity: the wider and more pro-

longed the vibration, the more vigorous and general the idea produced. Conti was thus able to translate Malebranche's notion of "attention" in mechanistic terms; the greater the number of vibrations and their duration, the more the spirit can concentrate on one idea, examine it, analyze it, and compare its parts. This activity he called "*attention,* the foundation of all other spiritual qualities." Assuming all this to be true, it followed that male cerebral fibers, being drier, are capable of longer and more ample vibrations, from which abstract and complex ideas originate. Mathematics and fluxional calculus are singled out as examples of intellectual activities that are barred to women because of their physical constitution, but Conti also pointed out specific features in female works of literature, poetry, history, and the fine arts that demonstrated women's intrinsic, physically determined limitations.[11]

These and other similar physiological arguments about women being unfit to take up university chairs or enter the most prestigious professions became widely popular, as did the materialist rendering of Malebranche's theory of the mind.[12] In the 1770s, the debate on women's education reached its height with the controversy over the "thinking uterus"—that is, on the alleged influence of her sexual organs on a woman's mind. Contributions to this debate emphasized the power (*imperio*) of the body over the female mind (*animo*) and the fact that women were constantly determined by their "material machinery," particularly the uterus. Therefore, the capacity for reasoning would be "impeded, limited and confused" in women by their sexual organs.[13]

By that time, few criticized in print the prevailing physiological arguments, and those who did were often outside the academic and medical establishment. This was the case of the Venetian Giacomo Casanova, who published a sharp critique of the theory of the "thinking uterus," claiming that female virtues and vices are "artificial," the fruit of social convention and education. Casanova offered an array of arguments in support of his opinion that women reason exactly like men and then asked, If the uterus conditions women's behavior, why should not sperm condition men's?[14]

The themes of the artificiality of virtues and the necessity of deception had already been tackled in the work of another outsider, Francesco Algarotti, in his best-selling book *Newtonianesimo per le dame,* published in Milan in 1737 and soon translated into French, English, and Dutch. In its five dialogues, Algarotti popularized Newton's *Opticks* through the genteel and, at times, sensual conversation between a chevalier and a marchioness. In his dia-

logues, Algarotti frequently and skillfully used the gender discourse to promote his various cultural and commercial enterprises, from the fostering of his freelance career as a cosmopolitan author to a celebration of Masonic sociability as the way to regenerate society. What emerges from *Newtonianesimo per le dame* is that, although the marchioness would be able to learn geometry, she had better avoid it because it would be socially inconvenient and eventually counterproductive. Algarotti, who had studied experimental physics with Laura Bassi in Bologna, did not put forward anything resembling a theory of the female mind, explaining the exclusion of women from the practice of mathematical sciences as simply a matter of social convention. In the end, however, this hugely successful book reinforced the image of the new mathematical sciences as essentially a masculine arena and, as such, opposed their practice to other, more properly feminine pursuits.[15]

By the 1770s, though, positions such as Algarotti's and Casanova's were decidedly marginal to the debate, the cultural landscape being pervaded by the physiological reinterpretations of traditional beliefs about female weaknesses and inadequacies. It should be noted that Conti and his followers operated a crucial meaning-shift in the discourse on the female mind, and on the human mind more generally. In their writings, the intellect is no longer heterogeneous with imagination and sensibility but is itself affected by the material dimension and particularly by the physiology of the brain. The change is well illustrated by the way in which they use terms like *animo* and *attention*. The latter, used to describe a physical state of the cerebral fibers rather than a mode of a spiritual substance, has therefore lost all its theological relevance. The spiritual-versus-material divide that once ran between cognitive faculties has been abandoned, as has the doctrine of the two souls. Instead, the intellectual abilities and capacity for reasoning have shifted to the ontological status of other forms of sensitive and "material" cognition. The essential link between superior forms of cognition and the spiritual soul have thus been broken.

The displacement of the spiritual element from its key position in the process of knowledge production was far from being relevant only to the debate on women's education. In fact, the legitimizing of this displacement was one of the characteristic manifestations of the crisis and demise of the Catholic Enlightenment.

The phenomenon of the learned woman in the modern era is certainly not restricted to the region and period considered in this study. However, the

unusual "visibility of women in intellectual life" on the Italian peninsula between the late seventeenth and mid-eighteenth centuries has often been highlighted; indeed, "Italy was the only European country where women had, in a few cases, the possibility of participating actively in the scientific life of the academies and obtaining teaching posts there as well as in universities."[16] In particular, Marta Cavazza has studied the role of women at the University of Bologna and Paula Findlen has reconstructed the activities of various female practitioners, the *filosofesse,* in post-Galilean Italian science.[17] In her study of Laura Bassi's career, Findlen shows that Italian academic institutions, unlike their French and English counterparts, were places where talented women could "negotiate their way through the scientific networks," following patterns that would vary according to local circumstances.[18] Reflecting on the academic achievements of Italian women and on the overall positive attitude that seems to have surrounded them, Londa Schiebinger concluded that "Italy was an exception in Europe, and little is known about why women professors were acceptable to the Church and university."[19]

Gaetana's education, work, and academic legitimation illustrate how the socio-cultural project of the Catholic Enlightenment provided her with crucial resources to "negotiate her way" through the republic of letters and academia. They also suggest that enlightened Catholic culture was a significant condition for the achievements of other learned women. For instance, further research could explore the uses to which Catholic enlightened culture was put by women in Bologna, where the intervention of Cardinal Lambertini—who later became Benedict XIV—in favor of learned women was so pronounced that the city was referred to as a new "paradise of women." As for Milan, further evidence can be marshaled to confirm that Gaetana was not alone in using and contributing to enlightened Catholic culture. Learned women and female artists seem to have shared the same resources and patterns of action. Let us briefly consider the case of her sister Teresa and that of a now-forgotten dramatist and poet who was among the founders of the Trasformati academy, Francesca Manzoni.

Like other travelers before him, Brosses commented on the prominence of learned women in Milanese cultural life. He did not just refer to major attractions such as Gaetana and Clelia Borromeo. While visiting the Biblioteca Ambrosiana, for example, he met a young woman sitting behind a pile of Latin books, shoulder to shoulder with the famed doctors based in that ec-

clesiastical library. "I found it peculiar," Brosses wrote, "to see a woman working amid piles of Latin books."[20] The woman he had spotted reading Latin poetry and patristic literature was twenty-nine-year-old Francesca Manzoni (1710–43). Another child prodigy, Manzoni's education and achievements followed a pattern that in some ways resembles Gaetana's: at a precocious age, she learned Latin, Greek, French, and Spanish and studied natural philosophy; at the age of twenty, she composed two musical dramas; and three years later, in 1733, she published her most famous sacred tragedy, *Esther,* inspired by the heroine of the Old Testament and dedicated to the Empress Elizabeth Christine. Manzoni entered various local academies, including the Milanese colony of the Arcadia Society, where she was known by the pseudonym Fenicia Lampeatica, and the Accademia dei Filodossi, of which Gaetana was also a member. Manzoni was known in Lombard literary circles for her elegant poetry (mostly sonnets and *canzoni*), her interest in experimenting with the Milanese dialect, and her commitment to the reformed religiosity of the Catholic Enlightenment. From around 1730, she organized various editorial projects and later was among the founding members of the Accademia dei Trasformati, contributing substantially to its early cultural battles. In 1741, she married the Venetian poet Luigi Giusti and died in childbirth two years later, much mourned by her fellow Trasformati and by the doctors of the Biblioteca Ambrosiana, where a portrait of her is still preserved. Shortly after her death, her acclaimed version of Ovid's *Tristia* was published (1745).[21]

Manzoni had refined her literary skills under the guidance of the Olivetan monk Marcantonio Zucchi, known as Oraspe in Arcadia, a lecturer of theology at the University of Pavia and an improvisator poet.[22] The themes of her poetry and dramas were typical of the religious and cultural reformism that would shape the experience of the Trasformati. A defender of Muratorian *buon gusto,* Manzoni aimed, through her "sacred spectacles," to offer the public dialogues and "ways of reasoning" shaped by Christian morals and piety—although she was aware that some would disagree with abandoning the Aristotelian precepts completely and subjecting sacred topics to theatrical treatment.[23] In her equally unorthodox dialectal poetry, Manzoni wore the mask of Beltramina, a popular woman who chastised the customs and morals of her fellow citizens through sharp satirical verses. As seen through the lenses of Beltramina's popular wisdom, Milan was a great stage, where one could find comedy everywhere "without going to the theatre." At the same time, however, Beltramina is curious and aims to become

learned and wiser. Thus, on one occasion, she remains "enchanted" on the bank of a canal, her attention focused on the refraction of light on the water's surface, completely oblivious to the street noise. Absorbed as she is in her philosophical meditation, Beltramina ignores the remarks of passersby who criticize her thirst for knowledge.[24]

While her poems, particularly those in dialect, were composed for local consumption, Manzoni used her sacred tragedies and oratorios to obtain the prestigious patronage of the imperial court in Vienna. An oratorio is a text put to music, and in the eighteenth century, its form and style were similar to those of contemporary opera. However, the performance was delivered without scenery, costumes, or action, the events instead being narrated by the protagonists. The genre flourished in northern Italy, with oratorios by Antonio Vivaldi and others being staged in churches as well as in patrician palazzi. The libretti were based mostly on the Bible and hagiographical literature. At the court of Vienna, the Italian oratorio and the related genre *sepolcri*—which focused on the passion of Christ—became much appreciated substitutes for opera during Lent, and Italian composers and libretti were eagerly sought after. Manzoni was able to enter this particular cultural niche, and at least four of her oratorios were published and performed in the imperial capital: *Debora* (1735), *Gedeone* (1737), *La madre dei Maccabei* (1738), and *Il sacrificio di Abramo* (1738).

Through her productions, Manzoni obtained the patronage of the empress herself, Elizabeth Christine, who gave her the title of *poetessa dell'imperatrice,* the female equivalent of the title given to Metastasio. In 1739, Manzoni was amid the crowd that gathered in Milan's cathedral to see Maria Theresa, daughter of Elizabeth Christine and Charles VI. Manzoni had great hopes for the future monarch and aimed to obtain her patronage as well. In a lively letter to her brother, she described her daring attempt to meet the archduchess in person. At first, she had hoped that a patrician lady would let her have a private audience; then, when she realized this was not going to happen, she decided to act on her own. She waited until the conclusion of the service at the cathedral and then, as Maria Theresa was leaving the crypt of the treasure of San Carlo, Manzoni pushed her way in front of Her Highness, made a deep reverence, and handed her a bundle of papers containing some of her poetry. She did not have a chance to speak, of course. However, she was later informed that her rhymes had been read aloud much to the pleasure of the archduchess in her apartment at the Palazzo Regio-Ducale.[25]

Manzoni's papers reveal interesting connections with other learned women and female artists in Lombardy and elsewhere in northern Italy, women whose capabilities and knowledge, she remarked, "make our sex proud." Manzoni celebrated the painter Rosalba Carriera, the poet Luisa Bergagli, the philosopher Laura Bassi—whose philosophical theses she was eager to read—and "the very erudite" Gaetana, whose many virtues "make fall silent those who hate the learned woman." This is a recurring theme in Manzoni, who explicitly referred to heroines from the past in her contemporary poetry as a way "to humiliate those who want to lock women up." Manzoni even managed to enrol Our Lady of Sorrows in this campaign, turning her celebration into a celebration of "la donna forte," the strong woman who is not overwhelmed even by the most tragic events.[26] We can imagine that similar themes also ran through Manzoni's biography of Giovanna Eustachia (Eustachia della Croce), a humble but strong-willed nun (*terziaria francescana*) who traveled to Madrid to meet Philip IV and ask for a donation to found a monastery in her native Lombard town of Vigevano, and also through the *History of Erudite Women,* on which she was apparently working at the time of her death.[27]

Motifs of women's moral and cognitive strengths can be found in the works of other Milanese women, particularly during the 1740s, when Maria Theresa became ruler of the Habsburg domains (1740) and empress of the Holy Roman Empire (1745). Those were the difficult years of the War of Austrian Succession, and Maria Theresa's ability to overcome adversity inspired numerous productions similar in the spirit to Manzoni's *Canzone a Maria Teresa d'Ungheria* (1740). Among the Milanese virtuosi who sought the patronage of the new empress were, of course, the Agnesi sisters. While Gaetana celebrated the intellectual abilities of women in her dedication of the *Instituzioni analitiche,* Teresa exalted their moral strength in her musical compositions. She had begun her career as a keyboard player and composer in the 1730s, an adolescent musical prodigy performing alongside her sister. Her first dramatic work was probably a cantata—*Il restauro d'Arcadia*—performed at the Teatro Ducale of Milan in 1747. The piece was dedicated to the Habsburg plenipotentiary Gian Carlo Pallavicini, an essential link to the Viennese court for the Agnesi.

Early in the 1740s, Teresa had sent a dozen arias to Vienna and, in 1748 or 1749, she completed and dedicated to the emperor her first *dramma per musica,* entitled *La Sofonisba,* a work explicitly occasioned by the name-day

of his consort, Maria Theresa. The work was politically charged, as it recognized and celebrated the titles and power of the Habsburg emperors after years of war, and their rule over Milan, which had been temporarily lost to Spain in 1745–46. This work, like many others produced by Italian and German composers in those years, was destined for private imperial consumption at Schönbrunn Palace. The story of the downfall and suicide of Queen Sophonisba was first told by Livy and had inspired numerous dramatic treatments since. It might seem a singularly inappropriate theme to celebrate the military and political successes of the empress. However, as shown by Giambattista Tiepolo's Milanese productions, the tragic figure of Sophonisba was rather popular among northern Italian audiences and artists.

Certain subtle transformations of the original story had indeed turned it into a celebration of female agency—very much in line with Manzoni's celebration of the "strong woman." This is best illustrated by Teresa's musical treatment. The libretto was composed within the Agnesi circle, possibly by Teresa herself or by one of her librettist friends, Pier Domenico Soresi or Luigi Giusti, Francesca Manzoni's husband, who were also both members of the Trasformati academy. Through careful use of the musical means and by changing the relative weight of the characters as seen in the traditional story, Teresa turned her Sophonisba into a character of strength akin to that of her heroic Roman enemy, Scipio. So, for example, they are the only characters to be given martial arias, and the coloratura in these arias is more demanding than in any other's. At the same time, the roles of the other male characters, including Sophonisba's husband, Syphax, have been drastically reduced. The result is that the queen is accorded full regal status, and she is the play's only resolute character, apart from Scipio; at various stages, Sophonisba even acts as if she rather than her husband were commander of the army. The traditionally long and pathetic scene of Sophonisba taking poison and dying is transformed into a short deliberation and a resolute action, which illustrate the heroic virtues of the queen rather than her emotional complexity and changing feelings. The drama is thus a celebration of Sophonisba's ability to act: she is a monarch struggling for her liberty who remains in control of her destiny until the very end—truly a new role model of female heroism, which is explicitly matched in the brave and resolute empress Maria Theresa.[28]

The cognitive and moral equality between men and women emerged as a popular motif in the works produced by learned women in Milan with the

support of the local Church.[29] The social status of women and, in particular, the opportunities for them to enter the arts and the sciences had been widely discussed—in enlightened Catholic circles at least—since the famous debate at the Accademia dei Ricovrati of Padua in 1723, organized by its then *principe* Antonio Vallisneri. The resulting publication (1728), which included the Latin oration recited by Gaetana, set the tone for the discussions on this topic in following years. Most contributors were ecclesiastic reformers sympathetic to the Muratorian line, and they expressed moderately favorable views toward women's education and the possibility for women to have careers as academicians, professors, and artists. Those who opposed these views did so on the basis of traditional arguments about the social disruption that would follow, which could be variously intertwined with moral and scriptural considerations. However, both sides shared the belief that, in principle, there were no significant cognitive barriers preventing women from performing similarly to men in these intellectual and practical activities.

The oration Gaetana read rejected three main kinds of objection to women's study: tradition, the alleged inability of the female mind, and the social disruption that would follow from this concession. On the contrary, the oration maintains, learned women would be better daughters and wives because they would be more aware of their religious and social duties. Historical examples are used to respond to the argument of tradition, while a rigid distinction is maintained between mental capacity and bodily structure, based on a clear dualistic vision of spirit and matter. Interestingly, the opinion that the weakness of the female mind is based on the weakness of the female body is described as a recent philosophical aberration.[30] The poetic compositions that accompanied the oration did not add significantly to these arguments. They pointed out the barbarity of excluding women from study and the liberal arts and argued for women's fitness to be guided by reason and virtue, exactly like men. Gaetana was unanimously recognized as a new champion and an example for other women. Gaetana Secchi Ronchi, from the provincial town of Guastalla, described the opinion that women would not naturally possess "spirit and virtue" as the fruit of a calculated deception to support the tyranny of man.[31] It was on this ground that enlightened Catholics opted for a moderate view, according to which a few extremely talented women could be allowed to enter traditionally masculine social spaces, such as academies and universities, but, indeed, only as exceptions.[32]

This position was defended in various works throughout the century and is often associated with the moralizing intention of reforming the institution of the conversazione, as in the instructions for the *civile conversazione* drafted by the Piarist priest Giovanni Giuseppe Cremona in 1724.[33] Its most systematic expression can be found in a two-volume essay by the priest Giovanni Nicola Bandiera, entitled *Treatise on Women's Studies* (1740).[34] Bandiera, who completed his book at the height of Gaetana's public performances, described the condition of wealthy and talented celibate women as an enviable and highly virtuous one, and he invited them to pursue all kind of studies, in association with intense devotional and charitable practices. Based on an ontological dualism grounded in the Augustinian tradition as well as in Cartesian philosophy, Bandiera defended the absolute identity of the male and female mind, saying that the spiritual dimension of a human being cannot be determined by the corporeal. Maintaining the opposite would have unacceptable theological implications, as the capability to contemplate eternal truths and participate in divine wisdom are essential requirements to achieving the state of beatitude in the afterlife.[35] "The spirit has no sex," Bandiera concluded, echoing analogous arguments from the seventeenth-century Cartesian tradition, most famously that of Poulain de la Barre.[36] Bandiera strengthened his theological considerations by observing that anatomists had not been able to find any significant difference between the female brain and its male counterpart.[37] And as women have identical intellectual abilities to men, they are perfectly able to study theology, philosophy, law, physics, mathematics, and all the other "sublime sciences" and liberal arts.[38]

Bandiera was not saying that all women should study these disciplines, though. Much of his book was devoted to clarifying which women should be allowed study which part of knowledge for the sake of their spiritual lives, that of their husbands and children, and the overall welfare of the state ("public happiness"). While he presented reading and basic arithmetic abilities as being desirable for large strata of the population, including artisans and manual workers, he recommended higher forms of education only for women from selected social groups.[39] More education was certainly needed, Bandiera claimed, by the wives of the "honorable citizens," which included wealthy merchants, manufacturers, lawyers, magistrates, physicians, and bureaucrats. That was, indeed, Bandiera's privileged audience; in various passages, he insisted on devaluing formal nobility as something that does not add "any real excellence to people" and encouraging the study of history

in order to realize that "true nobility" is based only on merit.[40] He also advised against mixed classes in schools and colleges, favoring instead teaching girls at home, preferably giving this duty to those ecclesiastics who were already in charge of the family's spiritual welfare. Girls would study the grammar of their own language and then Latin and Greek, plus various sciences, depending on their inclination and social position. Bandiera envisioned a future that included female schools and colleges, after a first generation of learned women had been trained.[41]

Knowledge of the scriptures and modern religious writings was also vitally important for "honorable women," so that, as wives, they could improve the spiritual lives of their family and servants. Some theology and metaphysics are useful for a correct religious education and for the morals of the family—which, Bandiera said, are threatened by Jesuit moral doctrines.[42] Some rudiments of civil law would enable a woman to deal with legal problems during difficult situations, such as the sudden death of her husband. Some knowledge of physics and the empirical sciences is necessary to educate children properly and dispel superstitious beliefs, while a familiarity with medicine would also be beneficial to the household. The acquisition of these and other useful portions of knowledge is only possible through reading Latin and some modern languages, particularly French and English, the study of which is recommended.

However, the in-depth study of theology, metaphysics, natural sciences, and mathematics would take too much time from the family duties of wives. Bandiera advises nuns to pursue some of these studies insofar as they are beneficial to their condition and to the proper functioning of their religious institution. Childless widows and "wealthy virgins" with no familial obligations, who live "ritirate e modeste" in their own houses, should be free to explore the vast realms of human knowledge "without any limits."[43] Their philosophical study should be based on modern authors and the most recent results of the experimental sciences, although always reinterpreted in an essential teleological framework and for obvious apologetic purposes. In particular, "wealthy virgins" can devote themselves to the study of mathematics, the "most noble" among the sciences.[44]

Bandiera insisted that women's access to higher education would not undermine the stability of the social order. For one thing, those allowed unlimited studies would be very few, even in the largest cities.[45] As for other women, study was to be permitted only to the extent that it would not impede them in the performance of their traditional duties, such as child-

rearing and managing the household. In fact, learning should raise, not undermine, women's awareness of their religious and social duties—hence its constant association with the values of chastity and *ritiratezza* for young virgins and submission for wives.[46] A learned woman would know how to carry them out more efficiently, to the great benefit of family, religion, and state. Bandiera explicitly condemned the study of poetry, music, dancing, and singing as pernicious to the morals of young girls. However, given their popularity and social significance, he gives some advice to parents about how to deal with dangerous poets and music teachers.

By the end of the book, it is clear that, to Bandiera, the reform of women's education could promote enlightened Catholic values in key areas of social life, from the family to the conversazioni. Bandiera perceived women as exerting a growing influence, hence the importance of their upbringing; "We live in times," he wrote, "when nothing is done without women."[47] In particular, he believed that women were well suited to fight "the modern corruption in conversation," disciplining its discursive and social practices.[48] Women would promote a new moral rigor, rejecting the relaxed moral precepts of the Jesuits while being careful not to concede to Jansenist excesses.[49]

Bandiera, a protégé of Benedict XIV and a correspondent of Muratori, saw the controlled access of women to education primarily as furthering the success of religious and social reform in Catholic countries. Far from being parochial, his arguments drew on the rich reformist experience of the Catholic Enlightenment. As we have seen, enlightened Catholics focused on the need for reform in teaching and popular education, which included provision for educating young girls from all backgrounds. The archbishops of Milan were particularly active in this respect, promoting not only the Confraternities of the Schools of Christian Doctrine and the popular schools of Piarists and Somaschans but also schools specifically devoted to the education of young women, such as those run by the Ursuline nuns.

This distinctive female congregation had been established in Brescia during the first half of the sixteenth century as a lay company of women—"virgins in the world"—who devoted themselves to active lives of charity without abandoning their lay status and their house.[50] Their original rules were later revised in Milan by Cardinal Borromeo, who favored the creation of new companies and their mobilization in his campaign of religious reform.[51] Borromeo invited the bishops of his archdiocese to support the com-

panies and promote their teaching. Throughout the seventeenth century, Ursuline houses underwent a gradual process of transformation into a monastic order under the Augustinian rule. The cloistering of the Ursulines was certainly symbolic of a Counter Reformist strategy to control social life and religious experience. However, the Ursulines remained focused on teaching despite their state of enclosure. Thanks to the implementation of a system of grates and controlled doors, they managed to increase the amount and scope of their daily teaching, turning their monasteries into schools open to girls from all backgrounds. The education of girls virtually became a fourth vow, added to those of poverty, chastity, and obedience.[52] Newly consecrated Ursulines vowed "to employ themselves in instructing young girls, proposing this for their principal end and aim . . . and devoting themselves to this with all their strength and concentration of mind, considering that by this they fulfill their vocation."[53]

Inspired by the schools of Christian doctrine, the Piarist schools, and the Jesuit colleges, Ursuline schools operated on three different levels: as boarding schools for the wealthy, as day schools for local girls, and as a Sunday school for those girls or women who worked during the week.[54] Pupils, divided into classes of around twenty, were taught reading, writing, spelling, grammar, the four rules of arithmetic, catechism, and the correct way to perform spiritual exercises, as well as needlework.[55] By the eighteenth century, other subjects were deemed necessary for the spiritual welfare of "an honest woman" and future mother and wife, including some Latin, history, and geography.[56]

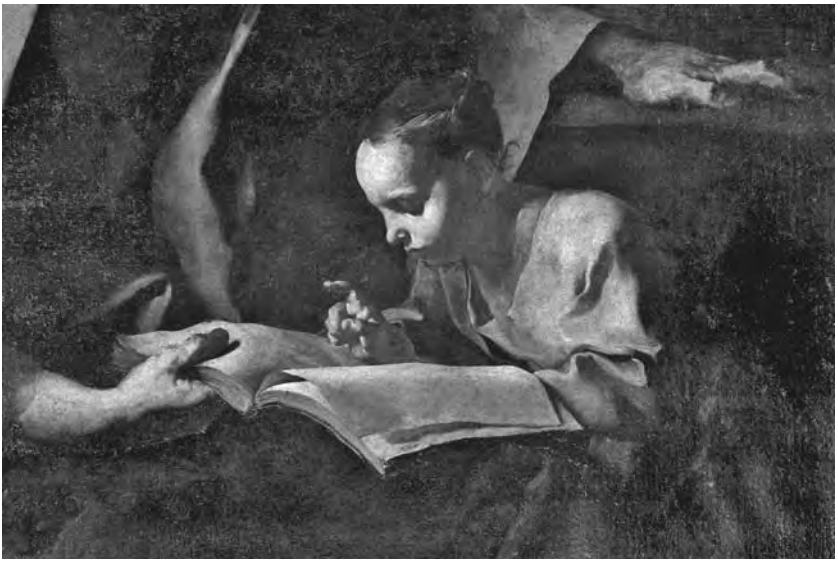
The archdiocese of Milan proved to be a veritable laboratory where the Ursulines and other lay houses of women experimented with these forms of female education, which the local Church authorities intended should favor the promotion and discipline of the learned and virtuous woman, while channeling her appearance, behavior, and spiritual practice along precise routes.[57]

The role of women was emphasized by enlightened Catholics for a variety of reasons. For one thing, women were one of the social groups that the Church was now willing to mobilize within its institutional network. Members of the merchant and professional classes, both men and women, were being enrolled as lay leaders of church-controlled institutions such as congregations and hospitals. This choice was part of a broader reorientation of the Church's social strategy, which aimed to compensate for the gradual ero-

sion of the urban patriciate's support by initiating a systematic mobilization of previously marginal social groups and emerging ones eager for social recognition. In fact, enlightened Catholic reformism was also shaped by the perception of the growing detachment of the traditional elites from the collective rites of religious life.[58] The artisan orders and "low people" were specifically targeted by a renewed missionary initiative, and new spaces were opened for members of these groups to participate actively in the life of their parishes. The flourishing of ascetic figures throughout the eighteenth century—again, both men and women, often from lowly backgrounds—was an important aspect of this process. The Church was looking for new, charismatic figures who could promote the new ideals of civil devotion and lay sainthood. Centered on social utility, these ideals contrasted bluntly with the baroque models of mystical and visionary sainthood. Education was thus considered necessary for young women to shape their devotion and prepare their future participation in the religious life of the community. Their role as mothers and first educators of their children made such education all the more relevant.[59] It should be noted that, during the same period, Benedict XIV modified canon law so that women as well as men could produce evidence during the processes of beatification and canonization, thus providing them with an unprecedented social and epistemological legitimacy.[60]

This new emphasis on female education found an interesting manifestation in contemporary visual culture: during the early eighteenth century, paintings representing the education of the Virgin were repeatedly commissioned in northern Italy, particularly by the teaching orders. These compositions portrayed the Virgin as a young girl who follows the lines of the holy scripture with her finger as she is being taught to read by her mother, St. Anne. St. Joachim is generally present but he looks distracted, if not drowsy. In 1744, Giuseppe Antonio Petrini created an altarpiece on this subject for the Somaschan college in Lugano. Like the rest of Petrini's antibaroque productions, it was an effective visual translation of the ideals of the Catholic Enlightenment.[61]

Arguments in favor of women's access to higher education were met with caution, however. While there was agreement among enlightened Catholics on the epistemological underpinnings as well as on the opportunities for widespread elementary education, the invitation for certain categories of women to study the "sublime sciences" raised some eyebrows. Muratori



Giuseppe Antonio Petrini, "S. Anna con la Vergine e Gioacchino" (1744). Lugano, Chiesa di San Antonio Abate (photo by Roberto Pellegrini).

himself, not unlike Michele Casati, was rather unimpressed by Bandiera's book, and both were suspicious of those conversazioni, noble and bourgeois, in which both sexes participated. In fact, leading figures of the Catholic Enlightenment remained by and large hostile to any substantial increase in the numbers of the *filosofesse,* for the traditional reason that social and moral disruption could follow.[62]

It is certainly true that Italian academies and universities were relatively open to women during the few decades in which the tenets of the Catholic Enlightenment found significant support in Italy, especially during Benedict XIV's pontificate.[63] However, it is important to realize that these institutions did not simply open their doors to women. Rather, as is clear in the cases of the Agnesi sisters and Francesca Manzoni, a few women were able to turn aspects and priorities of the culture of Catholic Enlightenment into opportunities, often significantly bending the original intentions of leading figures within the movement. In particular, the dualistic epistemology defended by enlightened Catholics lent itself to the legitimization of women's higher study. A sophisticated elaboration of Cartesian and Malebranchian doctrines, this approach assigned to the intellect the capacity to elaborate

purely intellectual—or "spiritual"—ideas through acts of intuition that were not mediated by any material components, such as the senses or the imagination. Indeed, as we have seen dealing with the doctrines of the two souls, the divide between the spiritual and material in the human being cut across the cognitive faculty. This was divided into pure reason—or intellect—of a spiritual nature and a set of inferior faculties of a material nature, namely, the sensorial apparatus, imagination, and fantasy, which humans share with animals. Both the philosophical tradition and the ascetic spirituality favored by enlightened Catholics converged in emphasizing the boundary between the material faculties of fantasy and imagination and the working of the spiritual substance of intellect. While the mysterious ways in which spirit acted on matter were deemed beyond the limit of scientific investigation, the reverse possibility—of matter acting on spirit—was excluded a priori. This explains, for example, how Muratori could accept traditional arguments about the overly active female imagination, while attributing to women spiritual capabilities and strengths equal to men's. On this basis, arguments about the inferiority of the female mind constructed on physical differentiation were systematically rejected. The spiritual equality of human beings was a crucial theological requirement, related as it was to issues of free will and salvation. In conclusion, the overlapping of spiritual substance and superior cognitive faculties, best symbolized in the polysemic notion of "attention," could be and was used to argue for women's capacity to philosophize, particularly in purely intellectual disciplines such as mathematics and theology.

With the radicalization of political and cultural debate during the 1760s, Benedict XIV's "third way" and the priorities of Catholic enlightened reformism rapidly lost ground. Change in the debate on women studying was only one aspect of the decline of Gaetana's world. The emergence of a new scientific discourse that naturalized the female intellect reduced opportunities for women to study, while reformers and devout conservatives alike once again revived the traditional argument about women's natural duties.[64] Typical of this literature—but with interesting additions about women's "organic weaknesses"—was *Disgrazie di Donna Urania, ovvero degli studi femminili,* published in 1793 by Benvenuto Robbio di San Raffaele. In this book, the protagonist's mishaps invariably result from her engaging with the sciences and her desire to become a *letterata*. The transparent message is that such ambitions are simply incompatible with the duties of wives and moth-

ers. Interestingly, Robbio dedicated the book to Gaetana, whom he held in high regard because she had chosen to abandon her studies and academic career. When one realizes that contemporary radical and Jacobin literature on women's education insisted on very similar points, it becomes clear that, by the end of the century, the sun had set on the world of the *filosofesse*.[65]

Epilogue

With Pietro's death in April 1752, the Agnesi family entered the prescribed six-month period of mourning. Black velvet drapes were hung at the windows of the palazzo, although probably not as many as Pietro might have wished. Recent decrees regulated not only the use of titles and the wearing of certain clothing but also the display of wealth through "funereal machines," reserving the most spectacular ones for the ecclesiastic and patrician elites. Thus Pietro's carriages were not upholstered in black velvet, nor did his servants sport a black livery, nor were the walls of the church covered in the same material during his funeral and the subsequent celebratory masses.[1] In fact, judging from their finances, the Agnesi would not have had the resources to pay for such items.

Tarchini and his aides were still inventorying the Agnesi possessions when Teresa announced her intention to marry Pietro Antonio Pinottini. The wedding was celebrated right in the middle of mourning, an act of glaring insubordination against paternal authority, although a posthumous one.[2] With the same swiftness, Gaetana signed a renunciation of her rights to the family estate in favor of her two brothers, Giacomo and Giuseppe. Her personal patrimony was remarkable, as it included not only her share of Pietro's possessions but also the legacy of her maternal uncle Carlo Alfonso Brivio, thus far administered by Pietro. In exchange for signing, she asked for an annuity of 2,000 imperial lire ("to be spent for those causes that She would prefer") and the right to continue to live in the paternal palazzo as well as to sojourn in the family's country villas.

A few days later, Gaetana, aged thirty-four, drafted her will, in which she made dispositions of her few remaining possessions. Small sums of money would go to her nun sisters, her maidservant, and some charitable institutions. Sums were also assigned for the liberation of those imprisoned be-

cause of their debts and of "Christian women slaves in the hands of Algerians or Turks"; for buying furniture for poor parishes; for the poor of the Ospedale Maggiore; and for the "impoverished families in which there are young women." Gaetana nominated as executor the parish priest of San Nazaro, her spiritual director at the time, and to him she left three paintings, including the portrait of San Gaetano that she had owned since childhood. The priest could also purchase "50 slabs of chocolate, of the kind that he prefers." To her "much loved" sister Teresa she left a jewel: "as a small token that would remind you of me."[3]

With Pietro's death, Gaetana could abandon for good the conversazione and devote herself completely to charitable work. She felt that her commitment to mathematics had concluded with the publication of the *Instituzioni analitiche* and that it was time to move on. Gaetana's attention remained focused on women from the urban lower strata, her aim being to provide assistance and education to the orphan, the prostitute, the old, the sick, and infirm. To all of them she wanted to offer the opportunity to approach faith, be it to enlighten the last part of their earthly path or to rescue them for society and a dignified life. According to one of her biographers, to those few who managed to reach her in her later years, she would explain: "Man always acts to achieve goals; the goal of the Christian is the glory of God. I hope my studies have brought glory to God, as they were useful to others, and derived from obedience, because that was my father's will. Now I have found better ways and means to serve God, and to be useful to others."[4]

In practice, Gaetana did not change her lifestyle dramatically, nor did she leave the family house; rather, she intensified her charitable activity. She was now free to care for more needy women in her wing of the palazzo, to devote more time to the assistance of the ill at the Ospedale Maggiore, and to catechistic teaching in local parishes. It was only in 1760 or 1761 that she decided to move to a more modest apartment in the parish of San Calimero, with her servant and her small infirmary.[5]

Meanwhile, visitors to the Palazzo Agnesi continued to ask to see Gaetana, and questions and essays were submitted for her comment. As late as 1762, the collected works of young mathematicians from a newly founded scientific academy in Turin, including one Giuseppe Luigi Lagrange, were sent to the palazzo for criticism and encouragement.[6] However, there is no evidence that Gaetana ever returned to her philosophical or mathematical studies after Pietro's death. Among the last traces of her activity in this field

are letters dated 1750 and directed to Antonio Frisi and to his brother Paolo (1728–84), a Milanese mathematician and natural philosopher. Paolo Frisi had asked Gaetana to read and comment on his mathematical dissertation on the physical reasons for the present shape of the Earth.[7] In her reply, Gaetana declined to comment, owing to her alleged incompetence. More sincerely, writing to her friend Antonio Frisi, she said that she respected Paolo's "deep thinking" very much, but, she continued, "to tell you the truth I couldn't advise him to publish his work." Gaetana thought that Paolo was dealing here with "a very difficult matter," and she believed that he had treated it in such a way as to compromise the "honor of religion." Other zealous clergymen shared her opinions: Frisi's superiors in the Barnabite order withheld their imprimatur for the essay.[8]

Through the early physical-mathematical research of Paolo Frisi, as through Gorini's sensationalist and hedonist essays, Gaetana came in contact with the doctrines that came to characterize the emerging Milanese Enlightenment. Frisi's main target was the work of the Jesuit natural philosopher Roger Boscovich. Gaetana must have felt little sympathy for Frisi's mathematizing rationalism, which was grounded on a belief in a truly cognitive function of mathematical analysis, conceived as the privileged tool for the investigation of empirical reality. Boscovich, a natural philosopher closer to her own inclinations, had never conceded such autonomous legitimacy to mathematical formalism, and he supported a philosophy of nature in an essentially geometrical form.[9] However, Gaetana did not enter the debates that characterized the Milanese Enlightenment during the second half of the century. She also remained uninvolved with *Il Caffé,* the periodical in which a new generation of intellectuals, mostly born to the patrician elite, developed their cultural and socio-economic reformism while forging an effective alliance with the Habsburg government.

As Gaetana's cultural and spiritual separation from her age grew, so did her physical detachment. The secluded and anonymous life she led during this period is illustrated in the way in which the sculptor Giuseppe Franchi created a marble bust of her in 1781. Because Gaetana rejected all invitations to sit for portraits, Franchi—in disguise—entered the hospital in which she was working and made sketches as she moved up and down the wards. Gaetana acknowledged the sculptor's ingeniousness and ability in a card she sent him in 1782; on this, she wrote that she admired his "theft," although she could not approve of it. Cardinals and pious patricians requested copies of the original bust in marble and gypsum over the next few

years, particularly in the 1790s, which indicates the growing interest of certain conservative Catholics in appropriating the figure of Gaetana during the crisis of the revolutionary years.[10]

By 1771, Gaetana's responsibilities had greatly increased, as she had become—without accepting any wage—the director of the female section of the Pio Albergo Trivulzio, a new charitable institution opened in Milan to assist the urban poor and invalid.[11] The Albergo was located in the palazzo of Prince Antonio Tolomeo Trivulzio, who had made it his universal heir. Opened in January 1771 with about one hundred patients, the number that would grow to 460 by 1791. Patients included the old, the chronically ill, and the disabled, grouped in categories such as "fatuous, dumb and blind," "crippled and monstrous," "afflicted by sores," "incurables." The largest group were the "old and unhealthy," with an average age of seventy. These patients were mostly plucked from the streets and church portals where they had been begging, while the able-bodied poor entered the institution as janitors and manual laborers. The staff included physicians, surgeons, nurses, and chemists.[12]

The inauguration of the Albergo, or Pio Luogo Trivulzio, as it was first known, came at a time of profound transformation in the management of Milanese charitable institutions and of Milanese society itself. The establishment of the Albergo and its like was one of the ways in which the authorities were trying to control the increasing numbers of urban poor and the rate of urban criminality. In fact, the classification of the poor was based on their perceived social dangerousness, with foreigners and able-bodied vagrants being targeted by new repressive regulations.[13] The Albergo was clearly designed to gather together and control less-threatening individuals. Managed by both the Church and the civil authorities, it was a last reflection of the local tradition in which the intervention of the Senate, the aristocracy, and the Church in all such institutions had once been finely balanced. This explains why Archbishop Pozzobonelli was collaborating with the Austrian governor on this project despite the growing tension between state and Church in all other areas of public life. Pozzobonelli's involvement is significant because it was he who insisted that Gaetana take on the directorship of the female section.

From the scant evidence available about Gaetana's new position, it appears that she faced the task with her usual determination. A few letters written in the early years reveal her struggle against the representatives of

the civil authorities to control the management of the Albergo. Thus, for example, Gaetana redefined the scope of her action and responsibilities to include the possibility of hiring nurses and paying them regularly, as well as of disciplining the patients. The latter duty she accomplished by controlling exit permits, punishments, and expulsions. She also demanded the authority to distribute work among able-bodied patients and to offer discretionary retribution, all "without reckoning to the Prefect." This was a delicate point, as controlling labor in the Albergo was a lucrative business and one usually managed by protégés of the Austrian governor.[14] Overall, Gaetana was well aware that her directorship was causing "great disgust" among the political referents of the Albergo, as "it takes away from them part of that absolute power that they desire so strongly."[15]

Other letters focused on the patients' living conditions, which Gaetana thought were being intolerably lowered by systematic overcrowding. Among other things, this overcrowding caused periodic shortages of food, which prompted Gaetana to rationalize the collection and distribution processes.[16] Her concern about hygienic standards and the quality of medical services provided at the Albergo prompted direct interventions; her sometimes scathing criticisms of staff members included a complaint about a surgeon whose notoriously trembling hand had already accelerated—if not caused—the deaths of some patients he bled.[17] Gaetana also dealt routinely with difficult cases of mental illness that might require her to make drastic decisions. Thus we read of Riva, a middle-aged woman who periodically attacked nurses and patients, convinced that they wanted to steal a sacred image of hers. After various attempts to keep Riva at the Albergo, Gaetana decided to let her make a one-way trip to the Senavra, the notorious lunatic asylum.[18]

In 1783, Gaetana moved to an apartment in the Albergo with her few remaining personal belongings. However, her detachment from the outside world was not so radical as the scarcity of evidence about her in these years could have us believe. The few surviving notes and cards reveal that she was still in touch with parts of her old network. Thus, as the wave of suppressions of ecclesiastical institutions intensified throughout the 1780s, Gaetana did not hesitate to ask for an audience with the governor of Milan, Archduke Ferdinand, and argue that a monastery of the Clarisse nuns be spared. She would also visit the palace of the governor when raising funds for her various charitable initiatives.[19] Although the then governor was too young

to remember Gaetana at the height of her fame, he certainly knew of her, as well as of her sister Teresa. In 1771, Teresa, who by then had become "an authority on the harpsichord" in Milan, had composed an opera in celebration of his wedding, which was presented at the Teatro Ducale with the productions of other composers—among them a young musician who was spending some time in Milan with his father looking for employment: Wolfgang Amadeus Mozart.[20]

As well as carrying out effective fund-raising, in the mid-1770s Gaetana was still writing a few letters of recommendation to the court in Vienna for individuals seeking lectureships at Pavia, as well as letters for those in need of more modest employment.[21] She also followed the vicissitudes of her family. Antonia Bonati, Pietro's third wife, had administered the family patrimony until 1757, when Giacomo became head of the house of Agnesi. However, he died in 1764, and in the following year the Palazzo Agnesi at the Pantano was divided into apartments to be rented out.[22] In 1773, Giuseppe, Pietro's only surviving son, inherited a very compromised situation, as his brothers had contracted debts that could not be repaid because most of the remaining properties were still under *fideicommissum*. Giuseppe's circumstances must not have improved much over time; in 1797, Gaetana had to intervene with the Milanese authorities to prevent the confiscation of his properties and ask for an extension of his tax payments.[23]

Gaetana died of pneumonia in her rooms at the Albergo on 9 January 1799, aged eighty-one. She was survived by Anna, Paola, and Giuseppe. He would die childless in 1818, with the Agnesi properties then passing to Anna's son.[24] With war again ravaging northern Italy, the Milanese authorities took little notice of Gaetana's death. In fact, she actually died a citizen of the Repubblica Cisalpina, "in the seventh republican year." All forms of outside ceremony had been prohibited to avoid disorder and confrontations between occupying French troops and the local population. In this tense situation, a rapid funeral mass was celebrated for Gaetana in Santo Stefano; then, at night, her body was transported to a cemetery just outside the Porta Romana, without any religious symbols or even the presence of a priest. There she was buried in an unmarked mass grave together with fifteen other women from the Albergo.[25]

The traces of Gaetana's struggle for legitimacy and autonomy in her direction of the Albergo offers an insight into the dynamics of the local resistance against Vienna's centralizing and rationalizing policy, which was widely per-

ceived as arbitrary and destabilizing.[26] This centralizing process gained momentum during the 1760s and 1770s, with the coordinated action of Minister Kaunitz in Vienna and Governor Firmian in Milan, and became more radical after the accession to the throne of Joseph II in 1780. The implementation of Viennese directions was necessary for the "construction of a new state," one based on a new relationship between state and Church, the emptying out of traditional local institutions, and the enrollment of local elites into the imperial bureaucracy.[27] The success of such a reform plan essentially depended on breaking the control that the patricians and the Church exerted over local administration, careers, education, and knowledge production—in fact, over virtually all aspects of social life. The full extent of such control was most visible at events such as the symbolic funeral of Charles VI (1740) or the triumphal parade of the newly nominated Archbishop Pozzobonelli (1744), when the integration of religious and secular power and their capacity to mobilize social groups was effectively displayed through the ceremonial spectacle. The exclusion of the Church from the management of public assistance, the reduction of the number of parishes, and the dismantling of the network of charitable lay confraternities were thus aspects of a broader strategy of social reshaping pursued by Vienna and supported by the enlightened elite of the local philosophes (*illuministi*).[28]

The shift from Muratori's "Christian charity" to state-controlled "social charity" accompanied the transfer of power from religious authorities to the bureaucratic apparatus of the empire.[29] Indeed, the rapid decline of Muratori's "third way" in social and cultural matters following the death of Benedict XIV in 1758 signaled the overall failure of the Catholic Enlightenment. Broadly speaking, the radicalization of the debate between *illuministi* and devout conservatives tore apart the movement and the delicate system of alliances that had supported it. In the last chapter, we sketched aspects of the cognitive dimension of this decline, and explored some of its consequences with regard to women's education.

However, it was not only the intellectual and political landscape that was to be reshaped but also the actual cityscape of Milan. The decline of the Catholic Enlightenment as a viable cultural and political option had a strikingly material dimension: the city itself changed its shape through the systematic demolition of religious buildings and symbols. Down went not only deconsecrated churches and suppressed monasteries but also the myriad holy signs and crosses that, as streets were enlarged and straightened, were classified as obstacles to the circulation of people and carriages—this em-

phasis on velocity and circulation being an interesting signal of the mercantilist doctrines' rising fortune. The brusque way in which these demolitions were carried out caused concern even among sympathetic *illuministi* such as Pietro Verri, who complained about the impressive quantity of Church silverware being carried through the city and the hundreds of former monks and nuns being forced onto the streets without any means of subsistence.[30] By the end of the century, seventy-eight of the two-hundred-odd city churches would be demolished, most of them to open new crossroads.

"Thus had fallen the framework of the Counter-Reformist city," noted a historian of architecture, "based on the ecclesiastical property and management of the main public institutions, and formally articulated through the obsessive repetition of symbols of cult and ecclesiastic power." It was to be replaced by new urban structures and architectural forms based on simple, economic, repeatable, and easily numerable modules inspired by the classical canons—veritable emblems of the consolidation of a new social and cognitive order.[31]

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Notes

Abbreviations

ABIB	Archivio Borromeo, Isola Bella
AGT	Archivio Generale dei Teatini, Rome
ASC	Archivio di Stato, Cremona
ASCM	Archivio Storico Civico, Milan (Biblioteca Trivulziana)
ASM	Archivio di Stato, Milan
BAM	Biblioteca Ambrosiana, Milan
BCR	Biblioteca Civica, Rovereto
BCU	Biblioteca Civica, Udine
BNT	Biblioteca Nazionale, Turin
BSP	Biblioteca del Seminario, Padua
BUP	Biblioteca Universitaria, Pavia
DBI	*Dizionario biografico degli italiani*. Rome: Istituto della Enciclopedia Italiana, 1960–
PSAN	Parrocchia dei Santi Apostoli e San Nazaro, Milan

Introduction

1. Truesdell, "Agnesi."

2. For an example of a recent apologetic biography, see Pinardi and Carolina, *Maria Gaetana Agnesi e il suo secolo*.

3. Marcucci Ricciarelli, *Elogio alla celebre italiana;* Mestica Chiappetti, *Vita di Maria Gaetana Agnesi;* Gabba, *Commemorazione di Maria Gaetana Agnesi;* Anzoletti, *Agnesi,* 415–31; Zanardi, *Agnesi;* Benazzoli, *Agnesi;* Tilche, *Agnesi*. For a recent invitation to initiate the process of canonization, see Bellù et al., *Maria Gaetana Agnesi,* 1: 38–39.

4. Findlen, "A Forgotten Newtonian," 313; Cavazza, "Les femmes à l'académie," 161; Cavazza, "Dottrici e lettrici dell'Università di Bologna"; Cavazza, "Lesbia e Laura"; Findlen, "Science as a Career in Enlightenment Italy." For Bassi, see also Berti Logan, "The Desire to Contribute"; Cavazza, "Laura Bassi"; Ceranski, *Und sie fürchtet sich vor niemandem;* Schiebinger, *The Mind Has No Sex?,* 16.

5. Hence placing myself under Jacques Revel's beautifully phrased banner: "Why make things simple when one can make them complicated?" See Jacques Revel, "L'histoire au ras du sol," xxiv.

6. The notion of "world" used here refers to the setting of socially constructed objects that we need to identify to understand the actors' actions. See Blumer, *Symbolic Interactionism,* 10–12. For an example of historiographical practice inspired by similar sociological insights, see Levi, *Inheriting Power,* and Gribaudi, *Mondo operaio e mito operaio*. On the use of the notion of "social strategy" in historiography, see Levi, "On microhistory."

7. In this study, key notions such as "individual" and "society" will be given the specific meanings they have in symbolic interactionism. See, esp., Goffman, *The Presentation of Self in Everyday Life;* and Goffman, *Strategic Interaction*.

8. Ginzburg and Poni, "Il nome e il come."

9. The experimental and explanatory aims of this study are clearly revealed by its focus on the processes of social differentiation, the working of social mechanisms, and the socially differentiated nature of meaning. For a critique of a cultural history deprived of social analysis, see Levi, "On microhistory," 105.

10. These conditions are conceived here as networks of relationships within larger and constantly changing social configurations. For this image, see Revel, "L'histoire au ras du sol," 12.

11. Therefore the evidence gathered in this study supports a collectivist and finitist approach to normativity, and to meaning in general, according to which knowledge is produced and sustained through situated collective action. This means that the meaning of any norm is reconstructed at every and each one of its applications by actors situated in contingent conditions. On meaning finitism, see Hesse, *The Structure of Scientific Inference;* Barnes, *T. S. Kuhn and Social Science;* and Bloor, *Wittgenstein, Rules, and Institutions*. On the empirical study of routine as the result of a continuous collective accomplishment, see Garfinkel, *Studies in Ethnomethodology;* see also the formal model developed in Barnes, "Social Life as Bootstrapped Induction."

12. On the notion of "conditional liberty," see Ginzburg, *The Cheese and the Worms,* xx–xxi. Microhistorical studies have often emphasized that, when subject to the variation of the scale of analysis, any apparently unified normative system reveals incoherencies and internal contradictions. This fragmentation is what ultimately renders the system open, thus enabling us to conceptualize social and cultural change—which emerges precisely through the minute strategies and choices of actors operating within the interstices of normative systems. However, the present study suggests that this fluidity is an essential aspect of the more general relationship between traditions and their carriers. The focus on gaps and contradictions as occasions for innovative behavior might leave intact the assumption that norms have, in principle, the power to fully determine actors' behavior.

13. For a similar use of microhistorical and ethnographic techniques to investi-

gate the production and assessment of scientific knowledge, see Redondi, *Galileo Heretic;* and Biagioli, *Galileo Courtier.*

14. For the outline of a social constructivist approach to mathematical knowledge, see Bloor, *Knowledge and Social Imagery,* 84–130. For sociohistorical case studies, see MacKenzie, *Statistics in Britain 1865–1930;* Mazzotti, "The Geometers of God"; and MacKenzie, *Mechanizing Proof.*

15. Schaffer and Shapin, *The Leviathan and the Air-pump*. For a theoretical analysis of the relation between social and cognitive order, see Barnes, who, in *The Nature of Power,* suggests conceiving society as a distribution of knowledge, and power as an aspect of this distribution.

16. For an overview of the recent literature, see Outram, *The Enlightenment;* and Munck, *The Enlightenment*. For analogous considerations on the notion of "scientific revolution," see Shapin, *The Scientific Revolution,* 1–14.

17. Clarke, Golinski, and Schaffer, *Sciences in Enlightened Europe,* and, more generally, Golinski, *Making Natural Knowledge*.

18. Barnett, *The Enlightenment and Religion*. See also Young, *Religion and Enlightenment;* and Pocock, *Barbarism and Religion*.

19. Porter, *The Creation of the Modern World,* xvii–xviii.

20. Franco Venturi made insightful comments about the potential of studying Enlightenment culture in its peripheral manifestations, where its features seem more extreme and its contradictions more radical. See, e.g., his *Utopia and Reform in the Enlightenment,* 133.

21. Hence the obvious reference to Jacques Le Goff. See his remarks in *Un autre Moyen Age,* 16.

22. Consider, e.g., the opposition of myth and science in Habermas, *The Theory of Communicative Action,* or the opposition between modernity and tradition in Giddens, *The Consequences of Modernity.*

23. For a critique of the Enlightenment myth in social theory, see Barnes, *The Elements of Social Theory,* 118–27. On the relevance of historical and anthropological evidence for assessing "rational behaviour," see, e.g., Levi, "On microhistory," 103; and Bloor, *Knowledge and Social Imagery,* 138–46.

24. See, e.g., Thomas Kuhn's insightful remarks in his "Function of Dogma in Scientific Research," in Crombie, *Scientific Change,* 347–69.

CHAPTER ONE Engaging in a Conversation

1. *Gazzetta di Milano,* 28 (15 July 1739), [1]; 29 (22 July 1739), [1]. For the description of other instances of similar events of public devotion, see BAM, ms. N 1–42 suss., Giovanni Battista Borrani, "Diario milanese dal 1737 al 1784." See also Signorotto, "Un eccesso di devozione."

2. Their taste was rather passé by Parisian standards, reflecting attitudes shared by provincial parliamentary elites. See Frédéric d'Agay's introduction to Brosses, *Lettres,* 1: 9–41.

3. Brosses, *Lettres,* 1: 140.

4. Zeppegno, *Le Chiese di Milano;* Fiorio, *Le Chiese di Milano;* Roda, *Guida alle chiese del centro storico di Milano*. For a collection of eighteenth-century engravings of Milanese churches, see *Le chiese di Milano*. For useful eighteenth-century guides, see Latuada, *Descrizione di Milano;* and Sormani, *De' passeggi storico-topografico-critici*. For the cathedral, see Frigerio, *Distinto ragguaglio dell'ottava meraviglia del mondo*.

5. Brosses, *Lettres,* 1: 135–52, 162–64. For Milanese galleries, see *Nota distinta della galleria Peralta;* Mottola Molfino, "Collezionismo e mercato artistico a Milano"; Melzi d'Eril, "Una collezione milanese"; Bertoldi, "Per il collezionismo milanese tra '600 e '700"; and Bona Castellotti, *Collezionisti a Milano*. For Manfredo Settala (1600–1680) and his museum, see Terzago, *Museo . . . del signore canonico Manfredo Settala;* Aimi, de Michele, and Morandotti, *Musaeum Septalianum;* and Navoni, "L'Ambrosiana e il museo Settala."

6. In 1783, with the introduction of street numbering, the building was given the number 4711. For the exteriors of Palazzo Agnesi and its location, see Tolfo, *Atlante milanese,* 276; and Bascapé, *I palazzi della vecchia Milano,* 72. The description of the interiors of the palazzo is based on an inventory dated 21 April 1752 in ASM, Notarile 43911. For a comparison with Parisian residences, see Coquery, *L'hôtel aristocratique*. Flags and horse tails captured from the Turkish enemy were hung in the cathedral of Milan in 1716, after the battle of Peterwardein.

7. ASM, Notarile 43911, 21 April 1752; Brosses, *Lettres,* 1: 160–62 (description of the Agnesi conversazione), 148–49 (description of the Simonetta conversazione).

8. Algarotti, *Il newtonianesimo per le dame*. For Algarotti's conversational Newtonianism, see Mazzotti, "Newton for Ladies." For the Parisian "salons," see Glotz and Maire, *Salons du XVIIIe siècle;* Goodman, *The Republic of Letters;* Fumaroli, preface to *L'art de la conversation,* i–xxix; Hellegouarc'h, *L'esprit de société;* and Craveri, *La civiltà della conversazione*. For the use of the term *salon* and the Parisian *esprit de société* as an object of historical investigation, see Fumaroli, preface to *Esprit de société,* vii–xx; and Boissieu, "Note sur le mot *salon*." For salon culture in Italy, see Betri and Brambilla, *Salotti e ruolo femminile in Italia*.

9. "Viro nobilissimo et litteratissimo Carolo Bellono Comiti Montis Acuti Beccariae, J. C. C. et Decurioni Regiae Civitatis Papiae," from Agnesi, *Propositiones philosophicae,* unpaged dedication. For Belloni's family, see ASM, Sitoni di Scozia, "Theatrum genealogicum familiarum illustrium nobilium et civium inclytae urbis Mediolani," vol. 1, f. 56. For the acquisition of Montù Beccaria (1665), see ASM, Feudi Camerali, Parte Antica, 395. For Belloni in Arcadia, see Vianello, *La giovinezza di Parini,* 49; and Bascapé, *I Palazzi della vecchia Milano,* 52. See also Porqueddu, "Gli ordinamenti del principato di Pavia." A few letters and manuscripts written by Belloni are in BAM, O.199–201.Sup. For the cultural and social meaning of *politesse,* see Revel, "Les usages de la civilité"; Starobinski, "Le mot civilisation"; France, "Polish, Police, Polis"; and Montandon, "Bienséances." See also the remarks on *politesse* in Darnton, "Two Paths through the Social History of Ideas."

10. Bona Castellotti, *Collezionisti a Milano,* 10–14, 91–111; Franchini Guelfi,

Alessandro Magnasco; Mandel, *The Art of A. Magnasco*. See also Haskell, *Patrons and Painters,* 228–41, 404.

11. ASM, Notarile 43911. See the family tree of the Brivio di Montevecchia in Calvi, *Famiglie notabili milanesi*, s.v. "Brivio." Carlo Alfonso Brivio (1697–1751) married Angela Gazzola and fathered Anna Fortunata (1699–1732), first wife of Pietro Agnesi and mother of Maria Gaetana. See the decree against the abuse of nobiliary attributions in BAM, Giorn. N. 1, 14 September 1750, *Regolamento delle armi gentilizie* (printed sheet), which included heavy pecuniary sanctions for artists, notaries, and scribes.

12. ASCM, Fondo famiglie, cart. 14.

13. ASM, Notarile 39037, testament of Giuseppe Mariani (28 Oct. 1717) and inventory of his properties (23 Dec. 1717).

14. ASC, Fondo Albertoni, cart. 126.

15. ASC, Fondo Albertoni, cart. 103.

16. ASC, Fondo Albertoni, cart. 129.

17. ASM, Notarile 39964, testament of Giacomo Agnesi (13 July 1730).

18. ASM, Fondo di Religione, cart. 1827, testament of Antonio Agnesi (14 Nov. 1739).

19. ASM, Notarile 39037, inventory of the properties of Giuseppe Mariani.

20. Romani, *L'agricoltura in Lombardia;* Angiolini, "Le basi economiche del potere aristocratico."

21. ASC, Fondo Albertoni, cart. 236.

22. ASCM, Fondo Famiglie, cart. 14; ASC, Fondo Albertoni, cart. 100.

23. The fief, previously owned by the Brivio and the Archinto, included fifty-eight households but had no feudal revenues. ASM, Feudi Camerali, Parte Antica, 388. See also Casanova, *Dizionario feudale,* 66–67. Charles VI's diploma is dated 28 September 1740.

24. A juridical procedure to demonstrate the "ancient usage" of the Agnesi's heraldic escutcheon was initiated by Pietro Luigi in 1770 and concluded successfully by Giuseppe in 1775. ASM, Araldica, Parte Antica, 41.

25. Signorotto, "Milano sacra," 594. Lecchi, *Descriptio apparatus;* Barbiano di Belgiojoso, *Relazione del funerale celebrato in Milano; Funerale pompa nelle esequie;* Perabo, *Ammirabile promozione;* "Corteo per l'ingresso del cardinale Carlo Gaetano Stampa" (1739), engraving by Marc'Antonio Dal Re, Milan, Raccolta Bertarelli, AS g 2–22.

26. See Pino, "Patriziato e decurionato a Milano." For the disciplining of heraldry and the reform of nobility in Habsburg Italy, see Mozzarelli, "Impero e città." For an overview of the institutional and political transformation of the state of Milan during the eighteenth century, see Capra, "Il Settecento." For the Ambrosian rite, see Borella, *Il rito ambrosiano;* and Paredi, *Storia del rito ambrosiano*.

27. Parini, *Il mattino* (1763), lines 1–6; see Parini, *Il giorno,* ed. Dante Isella, 1:5, and Bower's English translation.

28. Quote from Calvi, *Il patriziato milanese,* 74. For an assessment of the invest-

ment strategies of the Milanese elites, see Agnoletto, *Lo stato di Milano al principio del Settecento;* and Mocarelli, "Ascesa sociale e investimenti immobiliari." On the process of ennoblement, see also Levati, *La nobiltà del lavoro,* 17–60. For a comparison with other European contexts, see Angiolini and Roche, eds., *Cultures et formations négociantes;* Ribalta, *La burguesia mercantil;* and Richard, *Noblesse d'affaires*.

29. Rastelli, *Bombe sulla città*.

30. For the *corso,* see Brosses, *Lettres,* 1: 153; and Vianello, *Il Settecento milanese,* 32–35.

31. *Alla nobile fanciulla D. Maria Gaetana Agnesi*. Note that Gaetana is described as noble in the title and her name is preceded by the aristocratic prefix *donna*.

32. *Oratio qua ostenditur.* For the oration, see Findlen, "Maria Gaetana Agnesi," which includes an English translation. See also Anzoletti, *Agnesi,* 86–109; and Gerini, *Gli scrittori pedagogici italiani,* 85–88.

33. Gaetana to Casati, December 1739, BAM, O.201.Sup.

34. Piccolomini, *Della institutione morale;* Castiglione, *Book of the Courtier;* Vecce, *Gli umanisti e la musica;* Lorenzetti, "Per animare agli esercizi nobili."

35. Quotes from the description of the soirée in *Gazzetta di Milano* 50 (16 Dec. 1739), [1].

CHAPTER TWO Catholicisms

1. ASM, Notarile 43911, "Inventario degli abiti, ed altro, che erano ad uso del Sig. Don Pietro." See also Bascapé, *I palazzi della vecchia Milano,* 30–34; *Storia di Milano* (1959), 12: 903–46; and Cusani, "Diario storico del governo." For clothing regulations, see ASCM, Materie, cart. 683 "Prammatica" (1749); cart. 40, "Prammatica" (1769); and cart. 43, "Avviso per ordine dell'Eccelso R.I. Tribunale Araldico" (1771). See also Roche, *The Culture of Clothing;* and Medick, "Eine Kultur des Ansehens."

2. BAM, O.201.Sup., 73r, 77v, 82r (letters between Maria and her brother Gaetano dated 1739 and 1740). See also Frisi, *Agnesi,* 25–27; and Anzoletti, *Agnesi,* 85–86.

3. Brizzi, *La formazione della classe dirigente*. For an introduction to the social and political history of eighteenth-century Italy, see Carpanetto and Ricuperati, *L'Italia del Settecento;* and to the state of Milan, see Capra, "Il Settecento." For the emergence of the new patrician oligarchies, see Mozzarelli, "Stato, patriziato, e organizzazione"; Fasano and Gaurini, *Potere e società;* and Zenobi, *Corti principesche*.

4. Herman, *La pédagogie des Jésuites,* 66.

5. For the Jesuit college in Milan, see Giussano, *Vita di S. Carlo Borromeo,* 219; Latuada, *Descrizione di Milano,* 5: 288–91; Schuster, "Il Collegio della Madonna dei nobili"; Rurale, *I Gesuiti a Milano*. For France, see Dainville, "Effectifs des Collèges et scolarité," esp. 477–78. For Jesuit pedagogical innovations, see Dainville, *La naissance de l'humanisme moderne,* esp. 90–98 (use of textbooks) and 98–110 (on the lecturing system); and Dainville, *L'éducation des jésuites*. For the cases of discrimination, see Brizzi, *Formazione,* 161; and Vianello, *La giovinezza di Parini,* 56.

6. Fabre, "Dépouilles d'Egypte."

7. Brizzi, *Formazione;* Dainville, *Naissance*. See also Bianchi, "Introduzione," in *Ratio atque institutio studiorum Societatis Iesu,* esp. 48–56 (textbooks), 56–59 (Bellarmino's and other catechisms).

8. [Ceva], *Manfredo Septalio Academia Funebris*. For Jesuit Marian congregations, see Villaret, *Les Congrégations mariales;* Zardin, "Confraternite e 'congregazioni' gesuitiche"; Châtellier, *The Europe of the Devout;* and Maher, "How the Jesuits Used Their Congregations." For the functioning of academies, see Dainville, *La naissance,* 307–12.

9. Ijsewijn, "Symbola ad studium teatri latini Societatis Iesu"; Scaduto, "Il teatro gesuitico"; Dainville, *L'éducation des jésuites,* 473–517; Brizzi, "Caratteri ed evoluzione del teatro di collegio italiano"; Segura, "El teatro en los colegios de los jesuitas"; Valentin, *Les jésuites et le théâtre*. For Jesuit ballet, see also La Rocca, "The Jesuit Ballet"; and Rock, *Terpsichore at Louis le Grand*. For Jesuit theater in Milan, see Damiano, "Il collegio gesuitico di Brera." For the disciplining of mind and body through theater, see Fumaroli, "Les jésuites et la pédagogie de la parole," esp. 46–49; and Majorana, "Governo del corpo, governo dell'anima."

10. Frisi, *Agnesi,* 26; Cerretti, "Elogio di Girolamo Tagliazucchi," 532.

11. Tagliazucchi, *Ragionamento,* 37–45 (classification of human faculties), 128–33 (bad taste opposed to reason). For an example of critical reaction, see the preface to Ceva, *Scelta di sonetti*.

12. Tagliazucchi, *Ragionamento,* 49 (analysis), 51 (marvelous progress); BAM, O.201.Sup., 68r-69r (Manara to Gaetana, on her progress).

13. Tagliazucchi, *Ragionamento,* 169.

14. Tagliazucchi, *Ragionamento,* 169 (scholastic language), 2–84 (*genio* of a language), 111–14 (Cicero), 134 (*imprimere*), 153–68 (in defense of the vernacular), 223–27 (intellectual idleness as an offense against God, quote from 225). For the defense of vernacular, see also Tagliazucchi, *Prose e poesie,* 34–72.

15. Tagliazucchi, *Orazione e poesie,* 21–24 (Platonism), 24 (sparkles), 59–60 (attention). For the texts used in his course of eloquence at the University of Turin, see Tagliazucchi, *Raccolta di prose e poesie*. This include the essay "Della maniera d'ammaestrare la gioventù nelle umane lettere" (1: iii–clxviii), which is, in fact, identical to Tagliazucchi, *Ragionamento,* 33–240.

16. Tagliazucchi, *Ragionamento,* 223–24 (critique of the nobility), 226 ("true nobility"), 230–31 (the cost of education), 34 (final quote).

17. BAM, O.180–181.Sup. (Greek and Latin terms), O.182.Sup. (Hebraic and Latin terms), O.183.Sup. (mythological lecture and translation), O.184.Sup. ("Quinti Curtii in Italicum, Gallicus, Germanicus et Graecus idioma conversio"—first two books of Johann Freinsheim's supplement from Curtius Rufus, *De rebus gestis Alexandri Magni*). For Gaetana's vocabularies and grammars, see ASM, Notarile 43911, "Inventario della libreria." For the doctrines of *prisca theologia* and *philosophia perennis,* see Schmitt, "Perennial philosophy"; and Schmidt-Biggerman, *Philosophia Perennis*.

18. BAM, O.201.Sup., 98r–99v (Voigt to Gaetana).

19. Frisi, *Agnesi,* 27–29; Anzoletti, *Agnesi,* 124 (convulsions and the suicide attempt).

20. BAM, O.201.Sup., 68r–69v (Manara to Gaetana); Frisi, *Agnesi,* 30 (Gaetana moves on to study philosophy).

21. Marriage of Alfonso Brivio and Angela Gazzola: PSAN, "Registro matrimoni," 17 February 1697. The Brivios lived in Santa Caterina: PSAN, "Status animarum," from 1713. Marriage of Pietro Agnesi and Anna Marina Fortunata Brivio: PSAN, "Registro matrimoni," 6 June 1717. Pietro lived with the Brivios in "Casa Santa Catterina": PSAN, "Status animarum," 1718–1720. The baptism of "Margarita Gaietana, Angiola, Maria Agnesi," "nata il 16 del corrente alle hore diecisette": PSAN, "Liber baptizatorum," 23 May 1718.

22. AGT, Manoscritti, vol. 44, fol. 600; vol. 45, fols. 36 and 63; vol. 48, fol. 160; vol. 49, fol. 116; vol. 54, fol. 15; vol. 56, fol. 117; vol. 59, fol. 70.

23. PSAN, "Liber mortuorum," 13 March 1732, "cum facultate reverendissimi domini Vicarii Generalis salvo iure parochiali."

24. PSAN, "Liber mortuorum," 19 August 1737.

25. PSAN, "Liber mortuorum," 13 January 1740 (Angela Gazzola in Brivio) and 24 January 1751 (Carlo Alfonso Brivio).

26. ASM, Notarile 43911, 21 April 1752, "Inventario de' beni mobili. Nella stanza delle Sig.re Donna Maria e Donna Teresa" (portrait of San Gaetano).

27. *[Foglio di] Mantova,* 20, 20 May 1718, [4] (report on the celebrations in San Antonio, Milan); PSAN, "Liber baptizatorum," see 1718 and following years for the incidence of the name Gaetano or Gaetana. For the Theatines (Congregation of Regular Clerics), see Vezzosi, *Scrittori.*

28. Quoted in Frisi, *Agnesi,* 21. I have not been able to trace any copy of this particular edition.

29. *Lettere del glorioso S. Andrea Avellino,* 19–22 (obedience), 22–25 (flesh and spirit), 27–30 (despise the world and themselves).

30. For Borromeo and the Milanese church: Alberigo, "Carlo Borromeo"; Zardin, *Carlo Borromeo;* Turchini, *La fabbrica di un santo.* For the reform in religious architecture and its ideological underpinnings, see Gatti Perer, "Le *Istruzioni* di San Carlo"; and Cattaneo, *Arte e liturgia dalle origini al Vaticano II,* 177–79. For "Counter Reformation" as a problematic analytic concept, see O'Malley, *Trent and All That.*

31. Avellino, "Avvertimenti necessari." Quote from Scupoli, *Combattimento,* 69. Agnesi read the Paduan edition of 1724, printed by Giuseppe Comino and edited by Gaetano Volpi; see the list of books in ASM Notarile 43911. See also Vezzosi, *Scrittori,* 1: 70–88 (on Avellino), 2: 276–301 (on Scupoli). Augustine's quote is from *Patristica Latina,* 38, serm. 57, col. 239; on Cassianus, see *Dictionnaire de spiritualitè: ascetique et mystique, doctrine et histoire* (Paris: Beauchesne, 1932–95), s.v. "Cassien."

32. Scupoli, *Combattimento,* 73, 86, 82, 109, 85, 112–14, 175 ("questo signore crocefisso, figliuola mia, è il libro che io ti do da leggere"). For Theatine spirituality, see also Mas, "Spiritualità teatina."

33. Mas, "Spiritualità teatina," 75–80. Magenis, *Vita di S. Andrea Avellino.*

34. Vezzosi, *Scrittori,* 2: 347–48.

35. Quoted in Pastor, *Storia dei papi,* 16: 148. For Benedict XIV as a defender of Muratorian reform, see Appolis, *Tiers parti,* 125–74.

36. I owe my use of the term *Catholic Enlightenment* to the pioneering reconstruction by Appolis, *Tiers parti;* but see also Bertelli's review in *Rivista storica italiana* 77 (1965): 221–26; Margiotta Broglio, "Estremisti e moderati"; and Plongeron, "Recherches sur l'Aufklärung catholique." For the Italian context, see Codignola, *Illuministi, giansenisti, e giacobini;* Rosa, *Riformatori e ribell;* Brezzi, "Illuminismo cattolico nel Settecento"; Rogier, "L'Aufklärung cattolica"; Rosa, *Cattolicesimo e Lumi,* esp. the introduction (1–47); Carpanetto and Ricuperati, *L'Italia del Settecento,* 99–171. For a historiographical overview, see Manzoni, *Cattolicesimo Illuminato*.

37. Gaiffier, "Lettres de Bollandistes à L. A. Muratori"; Neveu, *Religion et érudition;* Barret-Kriegel, *Les historiens et la monarchie*. For Muratori, see Soli Muratori, *Vita del proposto L. A. Muratori;* and Muratori, *Opere*. For an assessment of Muratori's historical work, see Bertelli, *Erudizione e storia;* Cottignoli, *Alla luce del vero;* Marri and Lieber, *L. A. Muratori und Deutschland;* De Martino, *Muratori filosofo;* and Romagnani, *Sotto la bandiera dell'istoria,* esp. 91–109.

38. Lamindo Pritaneo [L. Muratori], *De ingeniorum moderatione,* 9, 55.

39. See, e.g., his essay against the *voto sanguinario:* Antonio Lampridio [L. Muratori], *De superstitione vitanda*.

40. *De ingeniorum moderatione* (on Galileo); Vecchi, *Muratori,* 114–38; Vismara, "Muratori immoderato."

41. For Muratori's Catholicism, see his *Della regolata devozione*. Other emblematic works of the "reasonable devotion" are Benedict XIV, *De servorum Dei;* and Amort, *De revelationibus*. The Sacred Heart of Jesus, which was gaining devotees in the mid-eighteenth century, responded fideistically and defiantly to recent medical claims that the site of all mental faculties was the brain rather than the heart. For Muratori's esthetic, see his *Della perfetta poesia italiana;* and Lamindo Pritaneo [L. Muratori], *Riflessioni sopra il buon gusto*.

42. For the notions of spiritual and temporal charity in Muratori, see his *Trattato della carità cristiana*. For charity informing Christian life, see also Muratori, *La filosofia morale;* Pistoni, *Discorsi agli ecclesiastici;* and Muratori, *Esercizi spirituali,* 420, which is also interesting for the relevance of mental prayer and the influence of Jesuit spirituality. For a positive evaluation of the Jesuit missions and the myth of the primitive church, see Muratori's *Il cristianesimo felice*. For charity as the supreme virtue in the Augustinian tradition, see Berti, *De theologicis disciplinis,* 3: 144, 472–73. For Muratori's religious and social reformism, see Vecchi, *Opera religiosa;* Vecchi, "L'itinerario spirituale del Muratori," 181–223; and Continisio, *Il governo delle passioni*.

43. Vecchi, *Opera religiosa,* 96–100.

44. Dixon, "Economics and Happiness."

45. Muratori, *Della pubblica felicità*. See the introduction by Cesare Mozzarelli, vii–xxxix; and Mozzarelli, "Aristocrazia e borghesia." Malebranche, *Recherche,* 161,

330–36. For Dietrichstein, see Tomek, *Kirchegeschichte Österreichs,* 3: 319; and Ammerer, "Von Harrach bis Schrattenbach." For Christian charity as the basis of human sociability, see, e.g., Leibniz, "Essais de Theodicée," esp. 27–28; and Leibniz, "Meditation on the Common Concept of Justice."

46. Concina, *Della storia del probabilismo;* Vecchi, *Correnti religiose,* 307–99. For Italian Jansenism, see Codignola, *Illuministi, giansenisti e giacobini;* Jemolo, *Il giansenismo in Italia;* Dammig, *Il movimento giansenista a Roma;* Vecchi, *Correnti religiose;* Stella, *Studi sul giansenismo;* Rosa, "Riformismo religioso e giansenismo"; and Maruti, *Teologia e politica*. See also Cottret, *Jansénisme et Lumières*. For a direct comparison of French and Italian Jansenism and for further references, see Hildesheimer and Pieroni Francini, *Il giansenismo,* esp. 145–211. The identification of the Catholic Enlightenment with the Italian Jansenism of the 1770s and 1780s is argued in Barnett, *The Enlightenment and Religion,* 168–200.

47. Important contributions to the renewal of Augustinian theology were Noris, *Historia pelagiana;* Bellelli, *Mens Augustini;* and Berti, *De theologicis disciplinis*. See also Stella, "Agostinismo e cultura patristica." For a comparison between Jansenists and enlightened Catholics, see Jemolo, *Il giansenismo in Italia,* 86–87; Appolis, *Tiers parti,* 122–24; and Cottret, *Jansénisme et Lumières,* 219–40.

CHAPTER THREE Trees of Knowledge

1. ASM, Notarile 43911, "Nello studio della Sig.ra Donna Maria."

2. Vezzosi, *Scrittori,* 234 (holy fervor); Barberis, *Biografia di monsignore Michele Casati,* 6 (Beccaria on Casati), 6–7 (Soresi); *DBI,* s.v. "Casati, Michele"; Quazza, *Le riforme in Piemonte,* 437; Soresi, *Saggio sopra la necessità e la facilità di ammaestrare le fanciulle;* Soresi, *Dell'educazione del popolo minuto*.

3. Casati, *Compendio della dottrina cristiana*. For this catechism, see Stella, "Alle fonti del catechismo di San Pio X." Casati, *Raccolta di lettere pastorali;* Vezzosi, *Scrittori,* 1: 240 (children's minds), 241 (hairdressing); see also Casati, "Lettera pastorale sulla inconvenienza che parrucchieri intreccino ed ornino la chioma alle femmine" [1772], BAM, P.245.Sup.

4. BAM, O.197.Sup. "De ultimo fine, summo bono, et felicitate naturali." See esp. fols. 2r (cause rather than chance), 8r ("in verus contemplatione, sive sapientia"), 8v–9r (clarify the intellect). For the nature of contemporary atheist and materialist currents and their cultural resources, see, e.g., Muratori, *Sulle forze,* iii–xxviii.

5. BNT, MS K³-IV-34, "Institutiones philosophiae moralis," fols. 2v (pure intellection), 162r–174v (Descartes on passions), 158v–160v (on being studious).

6. Pietro Verri, *Memorie appartenenti alla vita ed agli studi del signor Don Paolo Frisi* (1787), quoted in Anzoletti, *Agnesi,* 152.

7. Quérard, *La France littéraire,* 7: 315.

8. Pourchot, *Institutiones philosophicae,* quotes from the unpaged preface. The textbook was still popular in the 1730s (see the editions from Leiden and Padua). For Pourchot, see Jean Chrétien Ferdinand Hoefer, *Nouvelle biographie générale* (Paris:

Firmin Didot, 1862–70), s.v.; Louis Moreri, *Le grand dictionnaire historique* (Paris: Les librairies associés, 1759), s.v.; and Mouchot, *Notice sur Pourchot*.

9. Pourchot, *Institutiones,* 1: 34 (speculative and practical sciences); Joseph François Michaud, *Biographie universelle,* s.v. "Pourchot, Edmond."

10. Pourchot, *Institutiones,* 1: 6–8 (intellect and imagination), 494–500 (mind is passive), and 500–505 (attention as natural prayer).

11. For an early example of this move, see Tolomei, *Philosophia mentis, et sensuum*. See also Baldini, "L'evoluzione della 'fisica' dei gesuiti."

12. BAM, O.185.Sup., "Animadversiones in Edmundi Purchotii Institutiones Philosophicas et in aliqua Cartesianae Philosophiae Principia" (Newton cited on p. 131 of Gaetana's own pagination). BAM, O.186.Sup. fols. 9r–28r (Rizzetti vs. Newton).

13. BAM, O.187.Sup. 50r–66v (magnetism). BAM, O.188. Sup. 32r–50r (on the doctrine of the animal soul). But see also the passages on the comparison between animal soul and spiritual soul in Muratori's *Delle forze,* 29–31, 115–18, and 296. For the contemporary controversy about the animal soul, see Sbaraglia, *Entelechia seu anima sensitiva brutorum;* Rorario, *Quod animalia bruta saepe ratione utantur melius homine;* Monti, *Anima brutorum;* and Frasconi, *Anima spiritualis brutorum*.

14. Malebranche described and contrasted material sensation and intellectual perception throughout his *Search after Truth*. See also Jolley, "Malebranche on the Soul."

15. BAM, O.188.Sup. 50v–69v (reproduction). BAM, O.189.Sup. 42v (experience instead of theory), 18r–28r (brain and nervous system). For the functioning of the brain, animal spirits, imagination-fantasy, and intellect, see analogous considerations in Muratori, *Delle forze,* 9–24, 166–74, 286, and 299. See also the description of the brain and the nervous system in Malebranche, *Search after Truth,* 49–50, 87–99, and 354–55, whose main source is Thomas Willis, *Cerebri anatome* (1664).

16. BAM, O.190.Sup. 1r–15v (aurora borealis), 20v–30r (fossils), 32r–68v (vision), 48r (eye as camera obscura), 52v–68v (optical instruments).

17. BAM, O.201.Sup., 68r–69v. For Milan's military relevance and organization circa 1700, see Dattero, *Il "governo militare" dello stato di Milano*.

18. BAM, O.191.Sup. 1r–36v (gunpowder and ballistics), 29v (reference to Belidor), 27v–42r (shape of the earth); for the latter topic, see also BAM, O.193.Sup. 31r–36v ("De telluris figura"). In her final theses (1738), Gaetana adopted the view that the Earth was a prolate spheroid, while in a later letter, she returned to the oblate spheroid hypothesis. See Agnesi, *Propositiones,* 92; and Arrighi, "Incontri di Maria Gaetana Agnesi con Jano Planco," 685 (letters 1 and 2).

19. BAM, O.192.Sup. ("Physices principia matematica introductio"); BAM, O.193.Sup. 16r–31v ("Dissertatio physico-mechanica de gravitate) and 37r–44v ("De viribus corporum quae moventur"); BAM, O.199.Sup. 8r–20r (again on live forces); BAM, O.194.Sup. ("Gnomonices institutions elementares"); BAM, O.195.Sup. ("De mundo eiusque partium dispositione"), 7v–20r (scriptures and world systems), 20v

(process of Galileo). Similarly in Muratori, *De ingeniorum,* 101–7 (on the figurative interpretation of certain biblical passages).

20. BAM, O.186.Sup., "Dissertatio ad geometria preliminaris."

21. BAM, O.199–200.Sup., "Studi e corrispondenze sopra vari punti del *Trattato analitico delle sezioni coniche* del marchese de l'Hospital, ed altri studi di fisica-matematica." l'Hospital, *Traité analytique des sections coniques.* For Belloni as a guide in Gaetana's mathematical study, see BAM, O.200.Sup., fol. 1r (Belloni to Gaetana, 3 July 1735); fol. 2r (Belloni to Gaetana, undated); fol. 3r (Belloni to Gaetana, undated); fols. 30r–31r (Gaetana to Belloni, undated); fols. 26r–29r (notes on Newton's *Principia*).

22. BAM, O.200.Sup., fol. 7r–10r (Branconi to Gaetana, 16 Nov. 1738, with two other letters attached).

23. In the first class (logic), students were taught parts of *De interpretatione, Analytica priora, Analytica posteriora, Topica,* and *De sophisticis elenchis.* In the second class (physics), materials were taken from *Physica, De coelo,* and *De generatione et corruptione*. At this stage, students would also take some lectures in mathematics, the contents of which were normally limited to Euclid's *Elements.* In the third class (metaphysics), the lecturer read parts of *De generatione, De anima,* and *Metaphysica*. This last class included some lectures on moral philosophy based on *Ethica Nicomachea* and *Eudemian Ethics*. See Brizzi, *Formazione,* 233 (on Jesuit colleges using Purchot's course), 229–35 (on the reading of philosophy students).

24. Edmond Pourchot, *Exercitationes scholasticae in varias partes philosophiae, praesertimque in Aristotelis Metaphysicam sive serie disputationem ontologicarum naturali ordini dispositorum quibus praemissum est breve compendium philosophiae,* vol. 5 of *Institutiones,* 13–16 (in favor of the disputation method), 135–373 (disputations) and 374–407 (theses).

25. BAM, O.198.Sup., "Repertorio di diverse tesi sostenute da Maria Gaetana Agnesi in diverse accademie tenute nella propria casa," fols. 2r–25r (metaphysical questions), 27r–140r (natural philosophy: 27r–30r light and colors, 32r–32v spring waters, 51 rainbow).

26. Mazzotti, "Newton for Ladies."

27. Darnton, "Philosophers Trim the Tree of Knowledge." For Algarotti meeting with Belloni while in Milan and discussing problems in natural philosophy with him, see Algarotti to Eustachio Zanotti, 25 January 1738, in Algarotti, *Opere,* 12: 320.

28. Muratori, *Delle forze,* iii–xxviii (against atheists), xiii (first quote), 202–5 (political consequences of radical skepticism; no such thing as a society of atheists), 184 (dignity of reason), 166–74 (sensorial apparatus), 175–85 (reasoning). For the need to defend the *libertas ingeniorum* in nondogmatic matters, see also Muratori, *De ingeniorum,* 95–100.

29. Maffioli, *Out of Galileo,* 22 (Galiani's understanding of Newton's mathematical method).

30. According to Pietro Verri, the "libertà per i libri" in Milan was superior to that enjoyed "in any other Italian city, and perhaps even in France." See Montanari, "Vendere e comprare libri," 35.

31. Viñas, *Index bio-bibliographicus;* Picanyol, *Brevis conspectus historico-statisticus;* Giovannozzi, *Scolopi galileiani;* Caballero, *Orientaciones pedagógicas;* Picanyol, *Le Scuole Pie e Galileo Galilei*.

32. Gabuzio, *Historia congregationis clericorum regularium;* Premoli, *Storia dei Barnabiti;* Boffito, *Biblioteca barnabitica illustrata;* Michelini, *I barnabiti*.

33. *Methodus studiorum ad usus Congregationis de Somascha*. See also Zambarelli, *L'Ordine dei Chierici Regolari Somaschi;* Tentorio, "I Somaschi"; and Pellegrini, "San Carlo e i Somaschi."

34. For the active role of the Benedictine order in the renewal of scientific teaching, see Vecchi, *Correnti religiose,* 266–71.

35. Masetti-Zannini, "I teatini, la nuova scienza e la nuova filosofia."

36. Manara, *Prolusio in Gymnasio Ticinensi*. For this discourse, see Baldini, "L'insegnamento fisico-matematico." For Manara, see Arisi, *Cremona literata* 3: 77–78.

37. Purchot's *Institutiones* was reprinted repeatedly in Italy in the 1720s and 1730s; Corsini, *Institutiones philosophicae ac mathematicae*.

38. Corsini, *Institutiones metaphysicae;* and Corsini, *Fasti attici*. For Corsini, see Picanyol, *La biblioteca scolopica di S. Pantaleo,* 1: 65–67; *DBI,* s.v. "Corsini, Edoardo"; on his investigations of hydraulics, see Barbieri and Zuccoli, "Odoardo Corsini e la scienza delle acque"; for his friendship with Muratori, see Balzani, "Lettere inedite di L. Muratori al P. Edoardo Corsini."

39. Crivelli, "Leggi del moto"; Crivelli, "Della estimazione delle forze vive"; Crivelli, *Elementi d'aritmetica numerale;* Crivelli, *Nuova elementare di geometria;* Crivelli, *Elementi di fisica; DBI,* s.v. "Crivelli, Giovanni Francesco."

40. For the practice of disputation, see Dainville, *La naissance,* 135–38; Blum, "L'enseignement de la métaphysique dans les collèges jésuits."

41. See chap. 1, n. 9.

42. Agnesi, *Propositiones*. For the tradition of the thesis print, see Rice, "Jesuit Thesis Print and the Festive Academic Defence."

43. See also Muratori, *Delle forze,* 45–50.

44. Agnesi, *Propositiones,* 9 (probable knowledge).

45. Against Locke and on the innate nature of ideas "Intellectual, Universal, Abstract, and Metaphysical" as opposed to the ideas of material objects, see Muratori, *Delle forze,* 98, 104–5.

46. Agnesi, *Propositiones,* 81 (applications of the laws of motion).

47. Agnesi, *Propositiones,* 4, 19 ("universa natura clamat deum esistere"). For the contents of the *Propositiones,* see also Klens, *Mathematikerinnen,* 136–76.

48. Venturi, *Settecento riformatore,* 159–60, 180.

CHAPTER FOUR Choices

1. Brosses, *Lettres,* 162; Frisi, *Agnesi,* 36.

2. For the notions of *mondo* and *monde* in eighteenth-century moral discourse, see Fumaroli, "Premiers témoins du parisianisme"; and Bury, "Le monde de 'l'honnête homme'."

3. Frisi, *Agnesi,* 36–37; Gutton, *La societe et les pauvres en Europe;* Capra, "Il Principe Trivulzio"; Malamani, "Per una 'ben ordinata carità' "; Onger, "Anziani e inabili nella famiglia povera urbana"; Brosses, *Lettres,* 153.

4. Frisi, *Agnesi,* 36–37, 65–66.

5. Vismara, "Il volto religioso di Milano," esp. 136–37 (quote); Vismara, *Settecento religioso in Lombardia;* Majo, *Dalla riforma cattolica a Gaetano Gaysruck*.

6. Frisi, *Agnesi,* 73.

7. ASM, Notarile 43911, "Inventario della libreria." See, e.g., the letters written by the secretary of the Institute of Sciences of Bologna to his Roman referents to have his permit renewed: BAM, Y.107.Sup., Zanotti to Leprotti, 9 May 1731. See also Infelise, *L'editoria veneziana nel '700,* 62–131 (on censorship).

8. Brosses, *Lettres,* 143–44.

9. Data from a 1743 report: see Turchini, "Tradizione borromaica."

10. For the emergence of this interpretive line, see Buratti Mazzotta et al., *La città rituale;* and Signorotto, "Un eccesso di devozione."

11. Olivieri Baldissarri, *I "Poveri prigioni";* Bottoni, "Le confraternite milanesi," in de Maddalena, Rotelli, and Barbarisi, *Economia, istituzioni, cultura,* 3: 595–607; Signorotto, "Milano sacra"; Roggiani, Olivieri, and Sironi, *Le crocette nella Milano di San Carlo;* Signorotto, "Un eccesso di devozione"; Zardin, "Le confraternite in Italia settentrionale"; Zardin, "Solidarietà di vicini." For an overview of confraternities in Italy, see Terpstra, ed., *The Politics of Ritual Kinship*.

12. *Regolamento della Reale Imperiale Congregazione del SS.mo Entierro; Funerale pompa nelle esequie;* Zardin, "Confraternite e 'congregazioni' gesuitiche"; Châtellier, "A l'origine d'une société catholique." See also Corbin, *La deposition liturgique du Christ au Vendredi Saint*. For the introduction into Milan of the Spanish devotion to the Madonna della Soledad, see ASM, Fondo Culto, parte antica, 1504, *Lettera scritta in Spagna da un divoto dell'insigne Congregazione dell'Entierro* (printed pamphlet dated 26 Apr. 1674).

13. Signorotto, "Eccesso di devozione"; Zardin, "Confraternite e congregazioni"; Garrioch, "Lay-Religious Associations."

14. To put Gaetana's antibaroque attitude in perspective, see Vismara, "Tradition et innovation"; Vovelle, *Piété baroque et déchristianisation;* McManners, *Death and Enlightenment*.

15. Frisi, *Agnesi,* 71; Anzoletti, *Agnesi,* 369–70.

16. ASM, Fondo di religione, 544, "Confraternita di Milano della Dottrina Cristiana in S. Dalmazio"; Carbone, *Dello ammaestramento de' figliuoli; Regole della Congregatione et scuole della Dottrina Christiana;* Tamborini, *La compagnia e le scuole della dottrina cristiana;* Grendler, *Schooling in Renaissance Italy,* 333–62, 425–29; Turchini, *Sotto l'occhio del padre,* 163–210.

17. Carbone, *Ammaestramento,* 145–46.

18. *Summario della vita Christiana;* Montorfano, *Modo breve et facile; Interrogatorio del maestro al discipulo;* Bellarmino, *Dottrina cristiana breve*.

19. Carbone, *Ammaestramento,* 93.

20. Noto, *Gli amici dei poveri di Milano,* 508–10; Garrioch, "Lay-religious associations," 43; Toscani, *Scuole e alfabetismo,* 115–40 (women teachers).

21. Carbone, *Ammaestramento,* 129–32; Grendler, *Schooling in Renaissance Italy,* 356–62. For the creation of Ursuline educational institutions, see Knerich, "Le Orsoline di San Carlo." For Ursuline didactics, see Annaert, *Colleges au feminine*.

22. Grendler, *Schooling in Renaissance Italy,* 333–62; Toscani, "Le Scuole della Dottrina Cristiana"; Tamborini, *Dottrina Cristiana,* 59–69.

23. Bressan, "Istituzioni ecclesiastiche e istituzioni," in Cenedella, *Dalla carità all'assistenza,* 42–43. For the eighteenth-century hospital, see Cosmacini, *La Ca' Granda dei milanesi,* 117–45.

24. Frisi, *Agnesi,* 66.

25. Muratori, *Della pubblica felicità,* 97–100 (social significance of the mathematical sciences).

26. Antonio Vallisneri to G. Giorgi, 17 October 1725, quoted in Generali, "Contributo all'edizione del carteggio di Jacopo Riccati," 77.

27. For Clelia, see Cusani, *Storia di Milano,* 3: 60–66; Giulini, "Contessa Clelia Borromeo del Grillo"; Tenca, "Cinque lettere di Clelia Borromeo"; Parabiago, "Clelia Borromeo del Grillo"; and Serralunga Bardazza, *Clelia Grillo Borromeo Arese*. For the Accademia Clelia Vigilantium and its constitutions, see Sassi, *De studiis literariis mediolanensium,* 201–17; Maylender, *Storia delle accademie,* 2: 21; and Baldini, "Attività scientifica." For the 1746 trial, see *Storia di Milano,* 12: 235–39.

28. Forte, *Archintea Laus,* 139–50 (Filippo) and 161–68 (Carlo); Mazzuchelli, *Gli scrittori d'Italia,* 2: 993 (dissertation on metaphysics). See also Maylender, *Storia delle accademie,* 1: 292; Baldini, "Attività scientifica," 510–11.

29. Quondam "L'istituzione Arcadia"; Quondam, "L'Arcadia e la 'Repubblica delle Lettere,'" 198–211; Cavazza, "Scienziati in Arcadia."

30. Quondam, "L'istituzione Arcadia," 394, 420–21.

31. Cavazza, "Scienziati in Arcadia."

32. *Sonetti de gli Academici Trasformati di Milano;* Farra, "Una rara edizione."

33. Farra, "Carlo Antonio Tanzi."

34. Giulini, *In morte del Conte Giuseppe Maria Imbonati;* Fontana, *Cenni storici sulla Accademia dei Trasformati di Milano,* 19–50.

35. Soresi, *Prose e poesie,* dedication, 83–116, 117, 196, 206, 241–61.

36. Virgil, *Georgica,* II, 70; Soresi, *I rudimenti della lingua italiana*.

37. Soresi, *Dell'educazione del popolo minuto,* 3–9 (priority), 9–14 (social relevance of catechism), 15 (vernacular versus Latin), 17 (quote), 20–21 (arithmetic), 24–29 (priesthood and higher studies), 45 (new pedagogical systems); Muratori, *Della pubblica felicità,* 107.

38. Del Borghetto, *Orazioni sacre,* 2:149–50 (Borromeo); Del Borghetto, *Dissertazioni,* 327–47 (tavern); Del Borghetto, *Lettere familiari,* 435 (cowl); 409–16 (letters to his nephew); see also his many letters to Somaschans and to Bolognese mathematicians and philosophers.

39. For "reasonable devotion," see Vismara, "Volto religioso di Milano," 153.

40. Arslan, *Petrini;* Soldini, *La pinacoteca Züst,* 50–51; Catenazzi and Beffa, "Un corrispondente luganese di L. A. Muratori"; Catenazzi and Beffa, "Senza di voi Lugano mi parrebbe un deserto"; Coppa, "La committenza degli ordini religiosi nella Lombardia austriaca"; "L'opera del Petrini in Italia"; Natali, "Petrini"; Bianchi, "Petrini durante il periodo luganese"; Gregori, "G. A. Petrini." For the visual representation of attention, see Fried, *Absorption and Theatricality,* 7–70.

41. Gorini Corio, *Politica, diritto e religione:* see the imprimatur (unpaged). *Index Librorum Prohibitorum,* 196.

42. For an assessment of the controversy, see Aligieri, *Osservazioni critiche*. See also *Alcune riflessioni su l'opera del signor marchese G. Gorini Corio; Memorie monastiche; Risposta ad alcuni aggravii;* and Aligieri, *Risposte apologetiche*.

43. See *DBI,* s.v. "Gorini Corio, Giuseppe"; Continisio, "Dal bene comune alla pubblica felicità; Continisio, "Politica, cultura e religione," which includes an interesting sample of letters of Gorini to Muratori.

44. Gorini Corio, *Rime diverse;* Gorini Corio, *Leggi di Dio;* Gorini Corio, *Teatro tragico e comico,* esp. "Trattato della perfetta tragedia," 1: 7–58, "Il Duca di Guisa," 2: 297–370 (edifying Christian tragedy), and "Il frippon francese colla dama alla moda," 2: 371–417 (satire of current morals, the *cicisbei,* and gambling).

45. Gorini Corino, *Leggi di Dio,* 40 (natural reason is enough to reach "tutti i dettami della nostra Religione"). Gorini Corio, *L'uomo, trattato fisico e morale*. See also Gorini Corio, *Legge, e costumi per principi evidenti,* printed in Agnelli's Luganese printing office to avoid censorship.

46. "Autografo di D. Maria Gaetana Agnesi per eccitamento di sua Eminenza il Cardinale Giuseppe Pozzobonelli Arcivescovo di Milano sull'opera del Marchese Giuseppe Gorini Corio intitolata: Politica, Diritto e Religione per ben pensare e scegliere il vero dal falso," BAM, O.203.Sup., fols. 1r, 2r, 9v. Cardinal Vincenzo Lodovico Gotti, of the Dominican order, was one of the most authoritative apologists and controversialists of the early eighteenth century, a professor of theology at Bologna and, for a short time, General Inquisitor of the Faith in Milan. Agnesi referred to his three-volume *La vera chiesa d Cristo,* of which she owned a copy, and to *Theologia scholastico-dogmatica,* a defense of the value of the scholastic tradition in theology.

47. Gorini Corio, *Politica, diritto e religione,* unpaged preface ("mettere [la religione] sotto i sensi"); Gorini Corio, *Legge di Dio,* 53 ("tutte le cose sotto i calcoli").

48. Frisi, *Agnesi,* 73–74; Anzoletti, *Agnesi,* 367; Pasini, "La cultura poliedrica dell'Agnesi," in *Maria Gaetana Agnesi,* 22.

49. ABIB, AD/LM Agnesi, "Il Cielo Mistico, cioè contemplazione delle virtù, de' Misteri, e delle Eccellenze del Nostro Signore Gesù Cristo." The text has been published in Anzoletti, *Agnesi,* 435–72; and in Bellù et al., *Maria Gaetana Agnesi,* 2: 1–59. See also Pozzi and Leonardi, *Scrittrici mistiche italiane,* 610–14.

50. Primarily the *Imitatio Christi* and the mystical writings of Bernard of Clairvaux (1090–1153), Bonaventura of Bagnoregio (1218–74), and Lorenzo Giustiniani

(1381–1456). Paul of the Cross (1694–1775) and Alfonso de' Liguori (1696–1787) recommended similar forms of Christocentric devotion.

51. Agnesi, "Cielo mistico," quotes from fols. 3r, 2r, and 14v. Gaetana's metaphors are interestingly similar to those found in Muratori's own private notes, where he states that "intellectual science" alone is not enough—it must be integrated into the "flame of works" (*fiamma d'opere*); cited in Pistoni, *Discorsi,* 111.

52. Prodi, "Riforma interiore e disciplinamento sociale"; Signorotto, *Inquisitori e mistici;* Signorotto, "Gesuiti, carismatici e beate"; Giuseppe Dalla Torre, "Santità ed economia processuale"; Rosa, "Prospero Lambertini." For Agreda, see Colahan, *The Visions of Sor Maria de Agreda*.

CHAPTER FIVE A List of Books

1. For the 1773 inventory of a similar-sized working library of a Jesuit lecturer of mathematics, see "Catalogo de' libri che appartengono alla camera del lettore di matematica," in Borgato, *Giambattista Riccioli,* 447–59.

2. ASM, Notarile 43911, 25 April 1752, "Inventario della libreria."

3. Locqueneux, "L'abbé Pluche."

4. Infelise, *L'editoria veneziana nel '700,* 9–61 (Venice) and 217–74 (Italian states); Dooley, *Science, Politics, and Society,* 148–61; Montandon, *Traites de savoir-vivre en Italie*. See also Elias, *The History of Manners;* Montandon, *Pour une histoire des traités de savoir-vivre en Europe;* and Revel, "Les usages de la civilité." Last quote from *Gazzetta di Milano,* 1 March 1752 [4].

5. For the *Giornale,* see also Dooley, *Science, Politics, and Society,* 62–129; Generali, "Il *Giornale de' letterati d'Italia*"; and Ricuperati, "Il *Giornale de' letterati d'Italia*."

6. Valcarenghi, *De saxis, acubus, ferreis vitreisque frustis*.

7. Zaccaria, *Storia letteraria d'Italia,* 1: 98. In the same years, the Jesuits promoted the recognition of miracles performed by their own saints within the philo-Jesuit nobility. See, e.g., the sheet *Relazione di un miracolo operato da S. Luigi Gonzaga* (Milan: Malatesta, 1749), one copy in BAM, GIORN.N.1, 1749.

8. Cadonici, *Informazione sopra il famoso ed agitato fenomeno*. His *Vindiciae augustinianae* was dedicated to Benedict XIV and had been praised by Muratori (Muratori, *Epistolario,* vol. 11, Muratori to Cadonici, 5 June 1748). See also his *Confutazione teologico-fisica del sistema di Guglielmo Derham* and *Dissertazione epistolare*. For the debate on false sainthood and the *discretio spirituum* (the means of testing whether visions were truly of divine origin), see Zarri, *Finzione e santità;* and Schutte, *Aspiring Saints*.

9. Critical responses to Canonici on Valcarenghi's behalf can be found in Franchetti, *Lettera intorno all'informazione sopra il raro ed agitato fenomeno;* and Zanotti, *Disanima sopra la lettera critica spettante il raro fenomeno,* 18. Benedict XIV, *De servorum Dei;* Muratori, *Della forza della fantasia umanal;* Fromond, *In dissertationem de saxis*.

10. Gandini, *Riflessioni sopra li vari pareri*. The dedication to Gaetana reads: "al-

l'illustrissima signora D.a Maria Gaetana Agnesi, socia dell'Accademia dell'Istituto, e lettrice di matematica nello studio di Bologna." See Gandini's criticisms against university teaching, and numerous biographical remarks, in *Disamina delle cagioni* and reports of his experiments in *Osservazioni*. For his expertise on convulsions, see his *La teoria delle convulsioni*. For his stance on smallpox inoculation, see Fadda, *L'innesto del vaiolo,* 175. For Gandini's biography, see also Cirenei, *Un grande teorico del '700;* and *DBI,* s.v. "Gandini, Carlo."

11. For a comparison with the libraries of Jesuit colleges, see Generali, "La biblioteca gesuitica"; and Pepe, "La biblioteca maggiore e minore." For an example of a library built along the same lines as the Agnesi's, see the library of the Bellisomi family of Pavia, which, according to an inventory datable between 1750 and 1760, contained a similar selection of titles and periodicals. The Bellisomi hosted a conversazione centered on the themes of Catholic Enlightenment, and it is very likely that many of the same people, including Manara and Belloni, also frequented the Agnesi conversazioni. See BUP, Fondi Ticinesi, ms. 151, "Nota de' libri esistenti nella libraria di Casa Bellisomi." For this library, see also Baldini, "L'insegnamento fisico-matematico," 885.

12. Luigi del Giudice to Gaetana, 3 September 1749, BAM, O.201.Sup.

CHAPTER SIX Calculus for the Believer

1. Bertola de' Giorgi, *Elogio di D. Luigi Stampa,* 10.

2. Torriceno, "Rampinelli," xx–xxi.

3. For Rampinelli, see Torriceno, "Rampinelli"; "Elogio del Padre D. Ramiro Rampinelli; Riccati, "Supplemento all'elogio del P. D. R. Rampinelli"; Brognoli, *Elogi de' bresciani;* and Guerrini, "Il maestro di Maria Gaetana Agnesi." The essays by Succi and Guerrini should be handled with care as they are riddled with factual errors.

4. "Elogio del P. D. R. Rampinelli," 54.

5. For early Newtonian circles in Rome and Naples, see Ferrone, *Intellectual Roots,* 1–40.

6. On this point, see Generali, "Repubblica delle lettere."

7. Rampinelli, *Lectiones opticae;* Rampinelli, "Institutiones mechanicarum," BSP, ms. 711. The latter has been transcribed in the original Latin in Vendola, "Ramiro Rampinelli," 11 (*sublimioris geometriae*) and 30–35 (lectio 5: *de motu in curvis lineis*).

8. Saccheri, *Euclides ab omni naevo vindicatus.*

9. Torriceno, "Rampinelli," xviii (algebra associated with astrology).

10. Caverni, *Storia del metodo sperimentale,* 1: 217–18 (Viviani on eloquence). For mathematical styles and strategies of social distinction, see Biagioli, "Social Status of Italian Mathematicians." For the technical development of the Galilean school, see Baldini, "La scuola galileiana." For a survey of scientific culture in the Italian states during this period, see Baldini, "Attività scientifica."

11. Grandi, *Quadratura circuli et hyperbolae*. The Camaldolese is a contemplative branch of the Benedictine order.

12. Maffioli, *Out of Galileo*. See also Baldini, "La scuola galileiana"; Escobar, "Il controllo delle acque"; Fiocca, "I gesuiti e il governo delle acque"; Fiocca, Lambertini, and Maffioli, *Arte e scienza delle acque nel Rinascimento*.

13. Italian scholars began to study Leibniz's methods at the time of his travel to Italy in 1689/90, and to apply them independently to problems of physics and geometry from around 1707, when the Swiss Jakob Hermann also began teaching them at the University of Padua. From 1720, infinitesimal analysis was regularly being taught at the University of Bologna by Gabriele Manfredi. See Mazzone and Roero, *Jacob Hermann;* and Roero, "La diffusione del calcolo leibniziano nel settecento." See also Pepe, "Il calcolo infinitesimale in Italia"; and Pepe, "Sulla trattatistica del calcolo infinitesimale."

14. Baldini, "Attività scientifica"; Romani, *L'agricoltura in Lombardia*.

15. Baldini, "L'insegnamento fisico-matematico"; Baldini, "Attività scientifica."

16. The chair had been vacant since the death of the Jesuit Giulio Cesare Brusati in January 1743. Although an experienced teacher, Brusati did not leave any mathematical publications. For Brusati, see Ferrari, "Julii Caesaris Brusati S. J. vita."

17. Baldini, "L'evoluzione della fisica dei gesuiti." See also Dear, *Discipline and Experience;* and Feingold, "Jesuits: Savants." Lecchi, *Arithmetica universalis Isaaci Newtoni,* unpaged preface (reference to Gaetana's *Instituzioni*). On this book, see Montucla, *Histoire des mathématiques,* 2: 170. For Lecchi, who was also a fierce defender of probabilism in moral theology, see Sommervogel, *Bibliotheque de la Compagnie de Jesus,* s.v. "Lecchi, Jean Antoine."

18. Gaetana studied the second edition of l'Hospital, *Traité analytique des sections coniques* (1720). Her materials and comments on l'Hospital are in BAM, O.199–200.Sup.

19. Arrighi, "Incontri di Maria Gaetana Agnesi con Jano Planco," esp. 685 (letters 1 and 2). For Giovanni Bianchi (1693–1775), also known as Jano Planco, see *DBI,* s.v. "Bianchi, Giovanni."

20. Tentorio, "Una lettera inedita di Maria Gaetana Agnesi."

21. Rampinelli to J. Riccati, 9 June 1745, BCU, ms. 1025, vol. 22 (introducing Gaetana; Pietro's desire to publish a volume). Gaetana to J. Riccati, 1 October 1746, in Soppelsa, "Carteggio," 127–28.

22. Gaetana to J. Riccati, 20 March 1748, in Soppelsa, "Carteggio," 134.

23. Agnesi, *Instituzioni,* 2: 693–700.

24. For the correspondence with J. Riccati, see Soppelsa, "Carteggio." See also Riccati, "Lettera alla Signora Maria Gaetana Agnesi." Seven letters from Gaetana to Giordano are in BCU, ms. 1025, vols. 1 and 2, but see also vol. 22, which contains 141 letters between Giordano Riccati and Rampinelli. Another sixty-two letters are in BSP, ms. 711, which also contains letters between Rampinelli and J. Riccati dated 1727–29. The works cited are Grandi, *Quadratura circuli et hyperbolae;* Manfredi, *De constructione aequationum differentialium primi gradus;* l'Hospital, *Analyse des infiniment petits;* and Reyneau, *Analyse démontrée*.

25. Agnesi, *Instituzioni,* unpaged introduction [2–3, 5].

26. Gamba, *Serie dei testi di lingua,* 581.

27. Agnesi, *Instituzioni,* 2: 433 (definition of "differenza, o flussione"), 433–57 (the "differences" of some geometrical magnitudes), 457–60 (rules of differentiation for sum, product, and quotient). For a description of the contents of the book, see Pepe, "Sulla trattatistica," 161–73; and Klens, *Mathematikerinnen,* 87–122, which also compares Agnesi's definition of infinitesimal with Euler's (129–33). For early foundational debates involving the French Oratorian group, see Mancosu, "The metaphysics of the calculus"; and Lacroix, *Traité du calcul différentiel et du calcul intégral,* 1: 488. For the interactions between continental and British tradition, see Grabiner, "Was Newton's Calculus a Dead End?"

28. See Leonhard Euler's paradigmatic textbook, *Introductio in analysin infinitorum*. For the progressive degeometrization of calculus and the emphasis on formal methods, see Bos, "Differentials"; Engelsman, *Families of Curves;* Fraser, "The Calculus as Algebraic Analysis"; and Fraser, "Lagrange's Analytical Mathematics," esp. 244–51. For the early development of calculus and the relations between the British and the Continental schools, see Guicciardini, *The Development of Newtonian Calculus in Britain;* and Guicciardini, *Reading the Principia*.

29. Montucla, *Histoire des mathématiques,* 2: 171, 663. For the perception of Cartesian geometry as old-fashioned, see Bos, "Rise and Decline of a Mathematical Theory."

30. Agnesi, *Instituzioni,* 1: 381 ("equazione alla curva da descriversi, che dicesi la *Versiera*"). Agnesi, *Analytical Institutions,* 222 ("vulgarly called the Witch"). In his notes to Galileo's "Trattato del moto naturalmente accelerato," Grandi had referred to "quella curva che io descrivo nel mio libro delle quadrature [1703], alla prop. IV, nata da' seni versi, che da me suole chiamarsi *Versiera,* in latino però *Versoria*." See Galilei, *Opere,* 3: 393. One finds the new term in Lorenzini, *Exercitatio geometrica,* xxxi: "sit pro exemplo curva illa, quam Doctissimus magnusque geometra Guido Grandus versoria nominat." On this matter, see Checchi, "Maria Gaetana Agnesi"; and Truesdell, "Corrections and Additions." For the later use of this curve in statistics, see Stigler, "Cauchy and the Witch of Agnesi." For Colson's own approach to calculus, see Guicciardini, "John's Colson's Ocular Demonstrations."

31. Maria Gaetana Agnesi to Jacopo Riccati, 1 October 1746, in Soppelsa, "Carteggio," 128; and Truesdell, "Agnesi," 133.

32. Truesdell, "Agnesi," 124; and Montucla, *Histoire des mathématiques,* 2:169.

33. Robinet, "La vocation académicienne de Malebranche"; and Robinet, "Le groupe malebranchiste."

34. Reyneau, *La science des grandeurs en general*. For the Oratorian group of mathematicians, see Malebranche, *Oeuvres completes*.

35. Juhel, "Le role des proportions," 114, 115.

36. "Geometry, then, should be regarded as a kind of universal science that opens the mind, makes it attentive, and gives it the skill to control the imagination . . . , and a controlled imagination sustains the mind's perception and attention": Malebranche, *The Search after Truth,* 429.

37. Malbranche, *Search after Truth,* 111.

38. Hankins, "The Influence of Malebranche."

39. Some of these traits and a general reevaluation of the Newtonian conceptualization of calculus can be found in Jacopo Riccati's later work. See Pepe, "Jacopo Riccati."

40. Hellins, "Agnesi's Analytical Institutions," 24: 655, 23: 156.

41. Various sheets in BAM, GIORN.N.1, *Gazzetta di Milano,* 1748–49 (executions), sheet dated 2 July 1749 (Harrach's edict on posses); *Gazzetta di Milano,* 17 December 1749 [4] (assault to Pallavicini's personnel); 25 February 1750 (Harrach's edict on cutting trees).

42. *Gazzetta di Milano,* 2 July 1749 [4].

43. Documents relative to Agnesi's affiliation to the Accademia dei Filodossi of Milan (1734), the Accademia delle Scienze dell'Istituto of Bologna (June 1748), the Accademia degli Erranti of Fermo (1755), and the Accademia degli Indomiti of Bologna (1756) can be found in BAM, O.202.Sup. See also letter from the secretary of the Academy of Sciences Zanotti to Gaetana, 20 June 1748, BAM, O.201.Sup.

44. Zanotti to Gaetana, 18 June 1749, BAM O.201.Sup.

45. Bassi to Gaetana, 18 June 1749, BAM O.201.Sup; Beccari to Gaetana, 18 June 1749, ibid.

46. The Grimani to Gaetana, 28 June 1749; Paciaudi to Gaetana, 5 July 1749, BAM, O.201.Sup.

47. Brancone to Gaetana, 30 October 1749, BAM, O.201.Sup.

48. See, e.g., Francesco Grisalini to Gaetana, 3 July 1749; and Raimondo Adami to Gaetana, January 1750.

49. Luchi to Gaetana, 1750; see also his letter dated dated April 1752. For Luchi, see Vecchi, *Correnti religiose,* 388.

50. Poleni to Gaetana, 5 July 1749, BAM, O.201.Sup.

51. Cervellon to Gaetana, 20 October 1749; Pallavicini to Gaetana, 5 October 1749; Gaetana to Rampinelli, December 1749 (description of the gift), BAM, O.201.Sup.

52. Letters from Marie-Antoine and Fredrick to Gaetana, August 1749, BAM O.201.Sup.

53. De Fouchy to Gaetana, 13 December 1749; Montigny to Gaetana, 8 December 1749 (quotes); Mairan to Gaetana, January 1750. A copy of the report is in BAM, O.201.Sup, 106r–107v: "Extract des Registres de l'Academie Royale des Sciences," dated 6 December 1749.

54. See, e.g., Mme de Fontanieu to Gaetana, 1749, [illegible signature] to Gaetana, September 1749 (reference to Contessa di Belgioioso), and De Saxe to Gaetana, October 1749.

55. Jacquier to Gaetana, July 1749, BAM, O.201.Sup. Newton's Latin translation appeared as *Philosophiae naturalis principia mathematica, auctore Isaaco Newtono, eq. Aurato. Perpetuis commentariis illustrata communi studio pp. Thomae Le Seur et Francisci Jacquier.*

56. Benedict XIV to Gaetana, 21 June 1749, in which the pope claimed that the book "will improve the literary reputation of Italy and of our Academy of Sciences of Bologna": BAM, O.202.Sup. See also Benedict XIV to Gaetana, 10 September 1750 (news of the appointment), ibid. The original diploma is dated 5 October 1750: BAM, O.202.Sup, f. 14. Luigi dal Giudice to Gaetana, 21 July 1750 (nominated without previous demand), O.201.sup; Beccari to Gaetana, 8 July 1750, ibid.

57. For the presence of learned women at the University of Bologna and the patronage of Benedict XIV, see Cavazza, "'Dottrici e lettrici dell'università di Bologna.'" See also *Alma Mater Studiorum,* which includes a short article on Agnesi (see under Vettori Sandor, "L'opera scientifica ed umanitaria di Maria Gaetana Agnesi").

58. "Stupitevi piuttosto che con saper profondo / Prodotto abbia una donna un sì gran libro al mondo. / È italiana l'autrice, signor, non è olandese, / Donna illustre, sapiente, che onora il suo paese." See Goldoni, *Il medico olandese,* 14: 22–23.

CHAPTER SEVEN A New Female Mind

1. Quotes from Frisi, *Agnesi,* 67–68. See also Anzoletti, *Agnesi,* 332–36. For Pallavicini's career and reformist action, see Capra, "Il Settecento," 268–300.

2. Quotes from Pizzocaro, "La 'gran guerra delle due dame,'" 25.

3. Guerci, *La discussione sulla donna;* and Guerci, *La sposa obbediente.*

4. Segneri, *Il cristiano istruito nella sua legge.*

5. See, e.g., Roncaglia, *Le moderne conversazioni volgarmente dette de' cicisbei.*

6. See, e.g., Costantini, *Lettere critiche, giocose, morali, scientifiche ed erudite,* 4: 95; 8: 14.

7. *Riflessioni filosofiche e politiche,* 22; Bettinelli, *Le raccolte.*

8. Pellandra Cazzoli, "Dames et sigisbées." See also Valmaggi, *I cicisbei;* Guerci, *La discussione sulla donna,* 77–121; Mari, *Venere celeste e Venere terrestre.*

9. See, e.g., Gennep, *Manuel du folklore français,* 1: 291–93, on the phenomenon of *valentinage* in France; and Martìn Gaite, *Usos amorosos del dieciocho en España,* 1–20, 60, 72, on the role of the Spanish *cortejo.* See also Pitt-Rivers, *The Fate of Shechem,* 40–47, on the compatibility of nobiliary honor and women's extramarital relationships in southern Europe. For a critical reassessment of *cicisbeismo* in a comparative perspective, see Bizzocchi, "Cicisbei."

10. For an overview of the *filosofesse* phenomenon and the related debate, see Messbarger, *The Century of Women.*

11. The first quote is from Conti, *Prose e poesie,* 2: 4. The letter on women, which appeared in the same volume, was reprinted as an appendix to Thomas, *Saggio sopra il carattere i costumi e lo spirito delle donne,* 197–229. For Conti, see "Notizie intorno la vita e gli studi del sig. abate Conti," in Conti, *Prose e poesie,* 2: 1–108; and Badaloni, *Antonio Conti.*

12. See, e.g., *Risposta di un socio dell'Accademia bottanica,* esp. 26–27; and Marcucci, *Amore fisico, saggio accademico.*

13. See [Petronio Zecchini], *Dì geniali della dialettica delle donne.*

14. [Giacomo Casanova], *Lana caprina.* For this controversy, see Giacomo Casa-

nova, *Lana Caprina,* ed. Mengal; and Cavazza, "Women's Dialectics, or the Thinking Uterus."

15. Mazzotti, "Newton for Ladies."

16. Findlen, "A Forgotten Newtonian," 313; Cavazza, "Les femmes à l'académie," 161.

17. Cavazza, "Dottrici e lettrici dell'Università di Bologna"; Cavazza, "Lesbia e Laura."

18. Findlen, "Science as a Career in Enlightenment Italy." For Bassi, see also Berti Logan, "The Desire to Contribute"; Cavazza, "Laura Bassi"; and Ceranski, *Und sie fürchtet sich vor niemandem.*

19. Schiebinger, *The Mind Has No Sex?,* 16.

20. Brosses, *Lettres,* 144.

21. For Manzoni's bibliography, see Rachele Farina, *Dizionario biografico delle donne lombarde* (Milan: Baldini e Castoldi, 1995), s.v. "Manzoni, Francesca." A rich selection of Manzoni's prose, poetry, and letters, dating from 1730 to her death, can be found in BCR, ms. 48.18–19. For her cultural activity and her network of correspondents, see letters in ms. 48.18. For the defense of the *buon gusto,* see, e.g., ms. 48.18, 1 May 1732, "Prosa di Fenicia," 1r–7r.

22. For Oraspe "duce" and "mecenate," see BCR, ms 48.18, "In lode d'Oraspe" [n.d.], and their correspondence. See also Manzoni, *Festevoli versi.*

23. Francesca Manzoni, *L'Ester,* xxix–xxx.

24. BCR, ms 48.19, "L'apparenzia" (1734); ibid., untitled (1732). For Manzoni and her cultural activity, see also Balestrieri, *Rime milanesi,* xv–xcv (introduction by Felice Milani).

25. Ms 48.18, Manzoni to her brother, May 1739. For a description of the visit, see Celidonio, *Relazione della venuta e dimora in Milano.*

26. BCR, ms 48.18, "Alla gentilissima e valorosissima Irminda Partenide [Bergagli]," n.d. ("saper che rende il nostro sesso altero"); ibid., "Per l'eruditissima Signora Maria Agnesi," n.d. ("Tutti ammutir color, ch'han tanto in ira / Donna, che di saver s'adorni, e fregi"); ibid., "Saggia Donzella, che in tuo' studi ai cura," n.d., ("a scorno di chi pure a Donna / chiusa la vuol"); ibid., Manzoni to Zucchi, n.d. ("desidereri, però con comodo, le tesi di Laura Bassi"); ibid., "Per la SS.ma Vergine Addolorata," n.d. ("Ecco, allora gridai, la Donna forte").

27. Manzoni, *Vita della veneranda serva di Dio;* Manzoni, *Storia delle donne erudite;* both cited in Farina, *Dizionario.* I have been unable to trace a copy of the former or to find traces of the second among her manuscripts.

28. For an analysis of the form and contents of the *Sofonisba,* see Kendrick, "La *Sofonisba* by Maria Teresa Agnesi." See also Carolyn De Jongh, "The Life and Keyboard Works of Maria Teresa Agnesi." Copies of the *Sofonisba* are preserved in Vienna at the Gesellschaft der Musikfreunde, Q1127, and at the Österreiche Nationalbibliothek, ms. 19230. The full title-page reads: *Alla Sacra Cesarea Maestà dell'Augustissimo Imperatore Francesco Primo La Sofonisba, posta in musica da D.na Maria Teresa Agnesi per il nome gloriosissimo dell'Augustissima Imperatrice Maria Teresa d'Austria, Regina*

d'Ongaria e di Boemia. For Tiepolo's fresco, see Boscaglia and Terraroli, *Tiepolo a Milano,* 27.

29. For the mobilization of the Milanese church in support of Maria Theresa, see Signorotto, "Milano sacra," 587.

30. Agnesi, *Oratio,* 11.

31. Agnesi, *Oratio,* 68.

32. *Discorsi accademici di vari autori*.

33. [Cremona], *Il retto uso della civile conversazione*. These themes are still present in the later work of another Piarist priest: Gaspare Morando, *La damigella istruita*.

34. [Bandiera], *Trattato*. For Bandiera, see *DBI,* s.v. "Bandiera, Giovanni"; and Guerci, *La discussione sulla donna,* 154–62.

35. Bandiera, *Trattato,* 94.

36. Bandiera, *Trattato,* 85. A similar point is made in Campastri, *La felicità del matrimonio*. Poulain de la Barre, *De l'égalité des deux sexes*. See Hoffmann, *La femme dans la pensée des Lumières,* 291–308; Lougee, *Le Paradis des Femmes;* Harth, *Cartesian Women*. For the use of Cartesianism, see also Angenot, *Le champions des femmes;* and Cohen, "'What the women at all times would laugh at.'"

37. Bandiera, *Trattato,* 92–93.

38. Bandiera, *Trattato,* 41–99 (the intellectual faculties of men and women are identical).

39. Bandiera, *Trattato,* 278.

40. Bandiera, *Trattato,* 439 ("niente di reale eccellenza porta la nobiltà sopra le persone"); 2: 230 (true nobility).

41. Bandiera, *Trattato,* 446–52.

42. Bandiera, *Trattato,* 70–72.

43. Bandiera, *Trattato,* 2: 34, 2: 335.

44. Bandiera, *Trattato,* 2: 152.

45. Bandiera, *Trattato,* ix.

46. Bandiera, *Trattato,* 103–8.

47. Bandiera, *Trattato,* 16, 2: 219.

48. Bandiera, *Trattato,* 10.

49. See, e.g., Bandiera, *Trattato,* 266 (against Miguel de Molinos) and 269 (against the so-called appellants).

50. Doneda, *Vita della B. Angela Merici,* 72. See also Mariani, Tarolli, and Seynaeve, *Angela Merici*.

51. *Regole della Compagnia de S. Orsola*.

52. Ledóchowska, *Angela Merici,* 2: 171–73.

53. Cited in Gueudré, *Au Coeur des spiritualités,* 48.

54. Annaert, *Collèges au féminin;* Turchini, *Sotto l'occhio del padre,* 288–307.

55. *Reglemens des religieuses ursulines,* 3–88. See also Braido, *Esperienze di pedagogia cristiana*.

56. Annaert, *Collèges au féminin,* 127–32.

57. Zarri, "Disciplina regolare e pratica di coscienza." On the eve of the revolu-

tion, the Ursulines had 9,000 nuns in France alone, who ran 350 colleges. See Walters, *The Ursuline Achievement,* 96. See also Gueudré, *Histoire de l'Ordre des Ursulines,* unpaged statistics.

58. Signorotto, "Milano sacra," 626; see also Groethuysen, *The Bourgeois,* 1–28.

59. For the Muratorian-Benedictian promotion of a new sainthood and the role of women in this model, see Rosa, "Prospero Lambertini."

60. Indelicato, *Le basi giuridiche del processo di beatificazione;* Giuseppe Dalla Torre, "Santità ed economia processuale." For previous doctrines, see Minnucci, *La capacità processuale.*

61. Arslan, *Petrini,* 58–61. The most famous representation of this subject is probably Giambattista Tiepolo's canvas (1732) for the church of Santa Maria della Consolazione in Venice.

62. Pistoni, *Discorsi agli ecclesiastici,* 72.

63. Cavazza, "Lesbia e Laura."

64. Franci, "Difesa delle donne"; Daston, "The Naturalized Female Intellect."

65. [Robbio di San Raffaele], *Disgrazie di Donna Urania,* esp. 61–81 (women's duties), 119 (organic weakness), and 122–31 (on Gaetana). For a comparison of contemporary Jacobin literature on women's education, see Rao, "Il sapere velato."

Epilogue

1. BAM, GIORN.N.1, 1748, sheet, 10 May 1748, decree of Count Harrach on the regulation of mourning.

2. ASC, Fondo Albertoni, cart. 49 (Teresa's wedding).

3. "In piciol contrasegno di mia memoria." ASM, Notarile 43911, 30 June 1752 (Gaetana's renunciation); ibid., 11 July 1752 (Gaetana's testament).

4. Frisi, *Agnesi,* 70.

5. Bellù et al., *Maria Gaetana Agnesi,* 1: 22.

6. Luigi Wicardel, Marquis de Fleury, a patron and founder of the Turin academy, sent Agnesi a volume of its proceedings, so that "nos jeunes Academicies puissant se vanter d'etre connus de vous; et profiter même de vos utiles avis" (quoted in Frisi, *Agnesi,* 79). The volume was *Mélanges de philosophie et de mathématique de la Société Royale de Turin* (1760–61), vol. 2.

7. Gaetana to Antonio Frisi, BAM, Y.150.Sup, 125r.

8. The essay was published thanks to the support of Count Donato Silva: Frisi, *Disquisitio mathematica.*

9. Redondi, "Cultura e scienza," esp. 685–97. For Frisi's varied scientific production, see also Barbarisi, ed., *Ideologia e scienza.* For Boscovich and the innovation of Jesuit culture in the mid-eighteenth century, see Baldini, "Boscovich e la tradizione gesuitica." For an overview of the Habsburg cultural and scientific policy in Milan, see Monti, "Promozione del sapere e riforma"; and Brambilla, "Libertà filosofica e giuseppinismo."

10. Anzoletti, *Agnesi,* 386 (Gaetana to Franchi). A marble reproduction commissioned by Cardinal Antonio Dugnani is in the Biblioteca Ambrosiana today.

11. Reports relating to Gaetana's directorship can be found in: ASM, Archivio Trivulzio, N.A., cart. 29, 14 April 1785, "Relazione di Monsignor Daverio al conte Trotti, presidente della Giunta delle Pie Fondazioni"; ASM, Luoghi Pii, cart. 281, 31 March 1791, "Esposizione dell'operato dagli Esecutori Testamentari del Principe Trivulzi da distribuirsi ai dodici Deputati del Capitolo."

12. Cosmacini and Cenedella, *I vecchi e la cura,* 52–57, 93–109. See also Gucciardini, *Il Pio Albergo Trivulzio;* Capra, "Il Pio Albergo Trivulzio"; and Capra, "Il Principe Trivulzio."

13. Capra and Ciserani, "Criminalità e repressione." For Prince Trivulzio, see Cremonini, "Ritratto inedito di un celebre benefattore."

14. ASM, Archivio Trivulzio, N.A., cart. 29, Gaetana to an anonymous correspondent, n.d.

15. ASM, Archivio Trivulzio, N.A., cart. 29, letters from Gaetana to Bollani, 7 April 1772, and to an anonymous correspondent, 29 April 1772.

16. ASM, Archivio Trivulzio, N.A., cart. 29, "Rilievi da farsi," 3 February 1772 (Gaetana's manuscript notes).

17. ASM, Archivio Trivulzio, N.A., cart. 33, Gaetana to Pellegrini, n.d. [post-1775]. See also *La nascita del Pio Albergo Trivulzio,* 111.

18. ASM, Archivio Trivulzio, A.M., cart. 29 and cart. 222, various letters from Gaetana to Pellegrini, n.d. [post-1775].

19. Anzoletti, *Agnesi,* 353–56.

20. Torno, *Mozart a Milano,* 28. Mozart composed *Ascanio in Alba* (KV 111) for the occasion.

21. Gaetana to an anonymous correspondent [probably Firmian], 5 February 1775, published in Anzoletti, *Agnesi,* 379–80; Gaetana to Kaunitz, 11 February 1775, published in Schettini, "Una lettera autografa di Gaetana Maria Agnesi."

22. PSAN, "Liber mortuorum," 13 March 1764 (Gaetano Agnesi); "Status animarum," 1765 ("Casa da nobile dei Sigg. Agnesi").

23. ASC, Fondo Albertoni, cart. 104 (the patrimony is divided between Pietro's three surviving sons in 1757); ibid., cart. 106 (the patrimony passes to Giuseppe, who is sued by creditors); ibid., cart. 49 (Giuseppe asks for a dispensation for the fideicommissi; n.d.); Archivio Verri, Milan, cart. 75, fasc. 1 (Gaetana to Pietro Verri, 19 Jan. 1797, in favor of her brother Giuseppe).

24. ASC, Fondo Albertoni, cart. 103 (funeral arrangements).

25. *Raccolta delle leggi, proclami, ordini ed avvisi,* 155; Calligaris, "A Milano nel 1798"; Tedeschi, *Origine e vicende dei cimiteri.* Shortly after her burial, her brother Giuseppe had a small memorial stone placed on the wall of the cemetery, which reads "MARIA CAJETANA AGNESI/PIETATE, DOCTRINA, BENEFICENTIA/INSIGNIS/H.S.E./DEC. AN. MDCCXCIX. V. ID. IAN/AET. LXXXI." The stone is now at the Castello Sforzesco.

26. Capra, "Lo sviluppo delle riforme asburgiche."

27. Capra, "Il Settecento," 433.

28. Vismara, "La soppressione dei conventi e dei monasteri"; Signorotto, "Milano sacra," 609–13; Taccolini, *Per il pubblico bene.*

29. Bressan, "Istituzioni ecclesiastiche e istituzioni." See also Annoni, "Assistenza e beneficenza nell'età delle riforme."

30. Taccolini, *Per il pubblico bene,* 59–60.

31. Mezzanotte, *Il centro antico di Milano,* 9 (quote), 11 (standardization and numbering of the streets). See also Mezzanotte, "L'architettura a Milano nel Settecento."

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